Series 1955, No. 8

Issued June 1960

SOIL SURVEY

Escambia County Florida

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with the
UNIVERSITY OF FLORIDA AGRICULTURAL EXPERIMENT STATIONS

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Escambia County will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodlands; and add to the soil scientist's fund of knowledge.

In making this survey, soil scientists walked over the fields and woodlands. They dug holes and examined surface soils and subsoils; measured slopes with a hand level; noticed differences in growth of crops, weeds, and brush; and, in fact, recorded all the things about the soils that they believed might affect their suitability for farming, engineering, and related uses. They plotted the boundaries of the soils on aerial photographs. Then, cartographers prepared the detailed soil map in the back of this report.

Locating soils

Use the *index to map sheets* to locate areas on the large map. The index is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. When the correct sheet of the large map has been located, it will be seen that boundaries of the soils are outlined and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they appear on the map. The symbol will be inside the area if there is enough room; otherwise, it will be outside the area and a pointer will show where the symbol belongs.

Finding information

Few readers will be interested in all of the soil report, for it has special sections for different groups, as well as some sections of value to all. The introductory part, which mentions climate and physiography and gives some statistics on agriculture, will be of interest mainly to those not familiar with the county.

Farmers and those who work with farmers will be interested mainly in the section, Soil Descriptions, and the section, Use, Management, and Estimated Yields. Study of these sections will aid them in identifying soils on a farm, in learning ways the soils can be managed, and in judging what yields can be expected. The guide to mapping units at the back of the report will simplify use of the map and the report. This guide gives the map symbol for each soil, the name of the soil, the page on which the soil is described, the capability unit in which the soil has been placed, and the page where the capability unit is described.

Foresters and others interested in management of woodlands can refer to the section, Forests and Forest Soils of Escambia County. In this section the types of forest are mentioned and factors affecting their management are explained.

Engineers will want to refer to the section, Engineering Applications. Tables in that section show characteristics of the soils that affect engineering.

Soil scientists will find information about how the soils were formed and how they were classified in the section, Genesis, Morphology, and Classification of Soils.

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

* * * * *

Fieldwork for this survey was completed in 1955. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time. This publication on the soil survey of Escambia County, Fla., was prepared cooperatively by the University of Florida Agricultural Experiment Stations and the Soil Conservation Service.

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SOIL SURVEY OF ESCAMBIA COUNTY, FLORIDA

SURVEY BY JAMES H. WALKER, IN CHARGE, AND VICTOR W. CARLISLE, UNIVERSITY OF FLORIDA AGRICULTURAL EXPERIMENT STATIONS

REPORT BY VICTOR W. CARLISLE, UNIVERSITY OF FLORIDA AGRICULTURAL EXPERIMENT STATIONS

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UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE UNIVERSITY OF FLORIDA AGRICULTURAL EXPERIMENT STATIONS

THE MILD CLIMATE of Escambia County favors diversified agriculture. The main crops are corn, soybeans, cotton, and potatoes. Dairying and raising of beef cattle account for a large part of the total farm income. Forests, which occupy about three-fourths of the county, are a valuable resource. A large number of industrial plants in and near Pensacola provide part-time employment for many rural inhabitants. Railroads, highways, and port facilities furnish transportation to outside markets.

General Nature of the Area

This introductory section is intended mainly for readers not familiar with Escambia County. It mentions the history, physiography, and climate and cites some statistics on agriculture.

Location and Extent

Escambia County is in the extreme northwestern part of Florida (fig. 1). It occupies approximately 657 square miles, or 420,480 acres. An additional 64,000 acres is water. The county extends from the Gulf of Mexico north to the Alabama-Florida line, a distance of nearly 50 miles. It is irregular in outline; it varies from 25 miles wide along the northern boundary to approximately 8 miles across at its narrowest part. Pensacola, the county seat, is in the southern part, about 175 miles west of Tallahassee, the State capital.

History

The first settlement in Escambia County was established by Spaniards in 1559 (*2*),[1] although previous attempts at settlement were made as early as 1516. The territory was under the jurisdiction of Spain, France, and England until 1821, when Spain ceded Florida to the United States. Escambia County then included the area between the Perdido and the Suwannee Rivers. It was later divided, and other counties established. The present boundaries of the county were set in 1842.

[1] Italic numbers in parentheses refer to Literature Cited, p. 79.

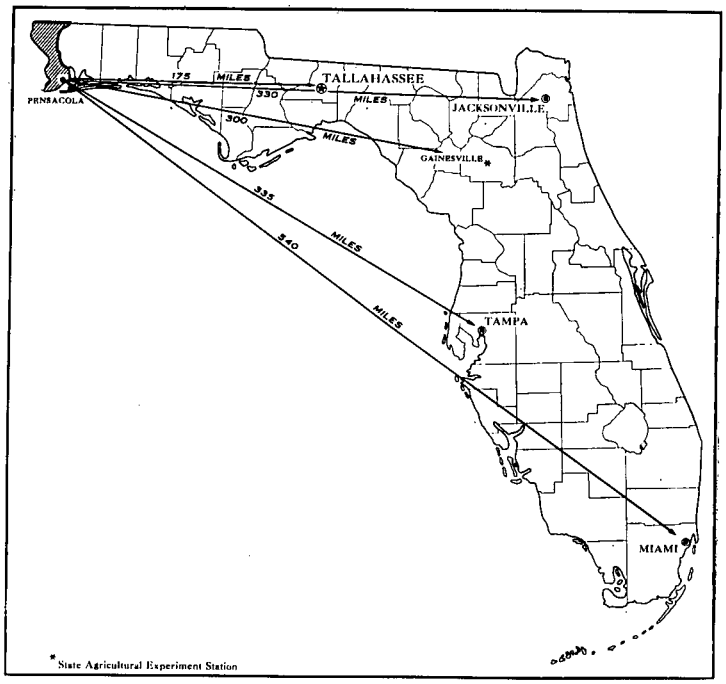

Figure 1.—Location of Escambia County in Florida.

The early settlers were of Spanish, French, Negro, and English descent. The Revolutionary war caused many loyal subjects of England to flee from Georgia, Carolina, and the other colonies to Florida. Some of them sought refuge in Pensacola (*2*).

Prior to 1900 the majority of the people were employed in lumbering and industries closely associated with it. As the timber disappeared, the acreage used for crops increased steadily. The population of Escambia County increased from 28,313 in 1900 to 112,706 in 1950.

Physiography, Relief, and Drainage

Escambia County lies in the Coastal Plain Province, a major physiographic division of the United States. The Coastal Plain extends from New York southward and westward into Texas. It consists principally of uncon-

solidated sands, silts, and clays deposited before the shoreline of the continental mainland reached its present position.

There are two topographic divisions in Escambia County: The Coastal Lowland and the Western Highlands (*3*). The Coastal Lowland consists of a series of broad, nearly level, marine terraces that extend several miles in from the coast in the southwestern part of the county and merge with the narrow terraces along the Perdido and Escambia Rivers. The highest terrace has an elevation of about 100 feet. Because of the smooth topography and the fairly short time since it was under the sea, the Coastal Lowland has little dissection and its drainage system is but weakly developed.

The Western Highlands have elevations that range from 100 to about 280 feet. They include the gently sloping to strongly sloping part of the county that begins 10 to 12 miles north of Pensacola. This division is characterized by a fairly well developed branching, or dendritic, drainage pattern. The valleys are V-shaped and have slopes that range from 8 to 15 percent. Along the bottom lands of the Escambia and Perdido Rivers and their larger tributaries the slopes are long and strong and the ridgetops are narrow and gently sloping. The slopes along the small streams are short and mild, and the ridgetops are broad and nearly level.

On the ridgetops throughout this Highland area loose sandy material of varying thickness overlies very slowly permeable sandy clay or sandy clay loam. Water moves freely down through the sand, but the clayey layer forces it to move laterally. This results in seepy areas or springs on the stronger slopes immediately above places where the clayey layer outcrops and wet or poorly drained soils on the slopes below. Thus, the soil in any area may be less well drained or much better drained than the topographic position would indicate.

The Escambia and Perdido Rivers and their tributaries drain about equal areas in the county. Most of the soils between these rivers lie high and have a moderately well developed drainage pattern. In the southwestern part of the county most of the soils are low and nearly level, and the drainage pattern into the adjacent bays is poorly developed.

Bottom lands along almost all the permanent streams are but a few feet above the stream and are subject to overflow.

Climate

Escambia County has a humid, warm-temperate climate (table 1). Summers are long and warm, and winters are short and mild. The average summer temperature at Pensacola is slightly more than 80° F., but temperatures reach 90° or more approximately 19 days in the period June through August. The average winter temperature is 55°, and on the average there are 9 freezes. The cold spells are short, and temperatures rarely go as low as 15° or 20°.

According to a 51-year record, the average date of the last killing frost is February 23, but killing frost has come as late as April 6. The average date for the first killing frost is December 7, though killing frosts have come as early as October 27. In the northern part of the county, the last killing frost comes about 2 weeks later in spring than in the southern part of the county, and the first killing frost in fall is about 2 weeks earlier than in the southern part. The growing season is approximately 300 days at Pensacola.

The annual rainfall is fairly high, nearly 62 inches on the average. Rainfall is well distributed, with a peak in July and August. Occasionally there is a short drought late in spring that considerably damages gardens, farm crops, and pasture. Snow rarely falls, but snowfalls measuring 2 to 3 inches have been recorded. Hailstorms are infrequent and cover very restricted areas.

TABLE 1.—*Temperature and precipitation at Pensacola, Escambia County, Fla.*

[Elevation, 13 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1954)	Wettest year (1953)	Average snowfall
	° F.	° F.	° F.	*Inches*	*Inches*	*Inches*	*Inches*
December	55. 1	77	14	4. 17	2. 55	14. 67	[3]
January	54. 0	79	14	4. 55	1. 89	4. 22	0
February	56. 0	78	7	3. 93	2. 27	9. 10	0
Winter	55. 0	79	7	12. 65	6. 71	27. 99	[3]
March	60. 2	87	24	6. 00	3. 50	4. 86	0
April	67. 0	92	34	4. 90	. 98	9. 82	0
May	73. 8	94	44	4. 36	2. 22	3. 88	0
Spring	67. 0	94	24	15. 26	6. 70	18. 56	0
June	79. 6	101	55	5. 17	. 83	8. 87	0
July	81. 0	103	62	7. 59	8. 42	5. 03	0
August	81. 2	99	62	7. 43	. 63	11. 28	0
Summer	80. 6	103	55	20. 19	9. 88	25. 18	0
September	78. 3	102	49	5. 78	2. 60	11. 11	0
October	70. 3	95	35	3. 88	1. 24	. 64	0
November	60. 2	81	25	3. 84	1. 53	6. 93	. 1
Fall	69. 6	102	25	13. 50	5. 37	18. 68	. 1
Year	68. 0	103	7	61. 60	28. 66	90. 41	. 1

[1] Average temperature based on a 76-year record, through 1955; highest and lowest temperature on a 51-year record, through 1930.
[2] Average precipitation based on a 76-year record, through 1955; wettest and driest years based on a 76-year record, in the period 1880–1955; snowfall based on a 51-year record, through 1930.
[3] Trace.

The prevailing winds blow from the north and northwest during fall and winter and from the south and southwest in spring and summer. Summer days are often sultry, but most of the nights are cooled by breezes. Wind velocities are moderate except during thundersqualls. Tropical storms and hurricanes, however, originate far out in the Gulf of Mexico and the Caribbean Sea, and sometimes they reach the coast and threaten life and property.

The climate favors production of many kinds of crops. Winters are mild. The soil is seldom frozen to a depth of more than an inch, and normally it stays frozen for

only a few hours. Winter cover crops are grown successfully. Oats, wheat, clover, rye, and ryegrass are commonly sown in fall; Irish potatoes are planted late in winter; and corn, cotton, and soybeans are planted in spring.

Agriculture

Residents of Escambia County did not turn to agriculture until forest resources were nearly exhausted, or about 1900. Farming got a slow start, partly because much of the soil was naturally unproductive and did not respond readily to the efforts of unskilled farmers. The main crops grown in the early days were corn, cotton, oats, hay, sugarcane, and sweetpotatoes. Minor acreages were used for pecans and peaches.

The farming now practiced is diversified. Under good management, the soils having a heavy sandy loam or sandy clay loam subsoil can be brought to and maintained at a high level of productivity. The principal crops are corn, soybeans, Irish potatoes, cotton, and small grains. Raising of hogs and beef cattle and dairying are major enterprises. Forests, however, occupy about three-fourths of the county and are still an important source of income.

Crops

Acreage of the principal crops and number of fruit and nut trees are listed in table 2 for the years 1929, 1939, 1949, and 1954.

Most of the acreage used for crops is on sandy loam soils in the north. Irish potatoes and soybeans are generally grown on soils that have a yellow subsoil, principally the Tifton and Irvington soils. The moisture content of these soils is most favorable for these crops.

Cotton is commonly grown on the well-drained Red Bay, Blakely, Carnegie, Norfolk, and Ruston soils. Corn is grown on all the well-drained soils, though the Tifton and Norfolk soils probably have the most favorable moisture content for this crop.

Vegetables are grown for home use on most of the farms. Among those more commonly grown are lima beans, snap beans, cabbage, sweet corn, cucumbers, okra, peas, onions, squash, tomatoes, turnips, potatoes, watermelons, and cantaloups.

The small acreages of oats reported in the period 1929–49 can be accounted for by the prevalence of rust. As rust-resistant varieties became available, the acreage of oats increased.

The acreage in soybeans has increased more than three times since 1950. Soybeans have been a dependable cash crop without acreage allotments. Much of the acreage now used for this crop was formerly planted to cotton. The acreage in hay has remained almost stable, in spite of the fact that the number of cattle on farms in 1954 was almost double the number on farms in 1950. The greater number of cattle have been fed mainly by improving the management of pasture and by planting greater acreages of crops for winter grazing.

The cold weather that occurs about once every 5 to 7 years severely injures orange trees. The number of trees has declined to an insignificant figure. Tung trees, however, survive most winters without damage from cold, and the number of trees has increased.

Most of the land not in crops is used as range pasture for cattle and hogs. The native vegetation in the range pastures varies widely with drainage and natural fertility of the soils. The main native grasses are wiregrass, wild oats, broomsedge, natalgrass, carpetgrass, crabgrass, maidencane, and many of the Paspalum grasses. In recent years many farmers have established permanent pastures by seeding various combinations of bermudagrass, bahiagrass, dallisgrass, orchardgrass, and clovers.

TABLE 2.—*Acreage of principal crops and number of fruit and nut trees of bearing age*

Crop	1929	1939	1949	1954
	Acres	*Acres*	*Acres*	*Acres*
Corn harvested for grain	10, 188	11, 645	6, 948	6, 563
Oats threshed	6	4	288	2, 835
All hay	1, 147	1, 232	980	1, 239
Cotton harvested	6, 704	3, 264	2, 425	1, 600
Irish potatoes for home use or for sale	543	1, 013	[1] 435	[2] 806
Soybeans for all purposes	144	267	[3] 3, 178	[3] 10, 948
	Number [4]	*Number* [4]	*Number* [4]	*Number*
Orange trees	29, 681	4, 697	172	19
Pecan trees	15, 267	12, 877	9, 856	8, 175
Tung trees	([5])	1, 866	38, 421	43, 469

[1] Does not include acres for farms with less than 15 bushels harvested.

[2] Does not include acres for farms with less than 20 bushels harvested.

[3] Harvested for beans.

[4] One year later than year at head of column.

[5] Not reported.

Livestock

Cattle.—According to the 1954 census, there were 14,273 cattle on farms of the county, an increase of 6,397 head since 1950. The number of milk cows on farms in 1954 was 4,273, an increase of 1,157 head since 1950. By comparing the increase in number of milk cows with the total increase in number of cattle, it can be seen that beef cattle account for a large part of the total increase since 1950.

Dairying leads among the livestock enterprises in value of products sold. The dairy products are sold mainly in Pensacola. The dairy cattle are mostly of Jersey or Guernsey breeds though there are a few Holstein-Friesian cattle. Increase in number of beef cattle has been accompanied by improvement of the herds through introduction of Hereford, Aberdeen-Angus, and Brahma bulls.

Hogs.—Hogs are raised on almost all farms, but on many they are kept only for home use. Most of the hogs run on the open range and, before they are butchered or sold, are fattened on corn. The quality of the herds has been improved by crossing native hogs with heavier meat-type breeds. There are two herds of purebred Durocs in the county.

Chickens.—Chickens are kept on nearly all farms for use of the family. Surplus eggs and chickens are sold.

Land Use, Tenure, and Equipment

The 1954 census shows some definite changes in land use since 1950. The number of farms in the county decreased from 1,525 in 1950 to 1,334 in 1954. During the same period, however, the total area of land in farms increased from 130,557 acres to 156,900 acres. The increase of land in farms, coupled with the decrease in number of farms, has made the average farm larger. In 1954, the average-size farm contained 117.6 acres, as compared to 85.6 acres in 1950.

The increase in acreage of land in farms led to an increase in acreage of cropland harvested but a decrease in total acreage of cropland. The acreage of cropland harvested in 1954 was 24,558, as compared to 20,708 acres in 1949. The acreage of all land pastured, including cropland and woodland pastured, increased from 44,096 acres in 1949 to 63,791 acres in 1954. The acreage of woodland also increased; the total was 72,910 in 1949, as compared to 94,898 acres in 1954.

Of the 1,334 farms in the county in 1954, a total of 1,061 were worked by full owners, 175 by part owners, 5 by managers, and 93 by tenants. By area, full owners operated 69,773 acres; part owners, 30,982 acres; managers, 50,931 acres; and all tenants, 5,214 acres. The proportion of farms operated by managers is small, but the acreage is large, or about half the acreage operated by full owners and part owners combined. Managers, however, reported only 614 acres of cropland harvested in 1954, which indicates that most of the acreage under their management is used for livestock.

Comparison of census reports for 1950 and 1954 shows increased mechanization on farms. In 1950, 331 farms reported 393 tractors, as compared to 568 farms reporting 656 tractors in 1954. There were 464 motortrucks on 436 farms in 1950, but in 1954 there were 629 motortrucks on 506 farms.

In 1954, 641 farms reported telephones; 1,264, electricity; and 1,073, piped running water.

Transportation

In 1954, the kind of road was reported for 1,446 farms as follows: 638 farms on a hard-surfaced road; 657 on a dirt or unimproved road; and the remaining 151 farms on a gravel, shell, or shale road. In the same year distance to the trading center most frequently visited was reported for 1,513 farms as follows: Less than 5 miles, 34.2 percent of the farms; 5 to 9 miles, 34.4 percent; 10 miles or more, 31.4 percent.

Serving the county are two airlines, Eastern and National; two buslines, Greyhound and Trailways; and two railroads, the Louisville and Nashville and the Frisco Lines. There are four United States Highways in the county. United States Highway No. 29 runs north from Pensacola; No. 90 passes through the city; Alternate No. 90 runs east and west 9 miles north of Pensacola; and No. 98 runs from Pensacola south and east.

Pensacola has one of the best natural harbors in Florida. Several steamship lines, operating both coastwise and abroad, maintain warehouses and docks.

How Soils are Mapped and Described

The scientist who makes a soil survey examines soils in the fields and woodlands. He classifies the soils in accordance with the facts observed and maps their boundaries on an aerial photograph or other map. The map shows the location of each kind of soil identified, as well as the roads, houses, streams, railroads, and other natural and cultural features of the landscape.

FIELD STUDY.—The soil scientist records everything about the soils that he believes might affect their suitability for farming. He examines surface soils and subsoils; measures slopes with a hand level; and notes differences in growth of crops, weeds, trees, and other vegetation. He bores or digs many holes to see what the soils are like. The holes are not spaced in a regular pattern but are located according to the lay of the land. Most of the time they are not more than a quarter of a mile apart, and sometimes they are much closer. Each excavation reveals several distinct layers, called *soil horizons*, which collectively are known as the *soil profile*. Each horizon is studied to see how it differs from others in the profile and to learn the things about the soil that influence its capacity to support plant growth.

Color is normally related to aeration, drainage, and the amount of organic matter in the soil. The darker the surface soil, as a rule, the more organic matter it contains. Streaks and spots of gray, yellow, and brown in the lower layers generally indicate poor drainage and poor aeration.

Texture, or the relative proportions of sand, silt, and clay, is determined by the way the soil feels when rubbed between the fingers. It is later checked by mechanical analysis in a laboratory. Texture determines how well the soil retains moisture, plant nutrients, and fertilizer and whether the soil is easy or difficult to cultivate.

Structure is the way the individual soil particles are arranged in larger aggregates, or peds, and the amount of pore (open) space between the aggregates. Structure indicates the ease or difficulty with which the soil is penetrated by plant roots, water, and air.

Other characteristics observed in field study and considered in classifying the soil are the depth of the soil over bedrock or compact layers; the presence of gravel or stones that may interfere with cultivation; the steepness and pattern of slopes; the degree of erosion; the nature of the underlying material from which the soil developed; and the reaction (acidity or alkalinity) of the soil as measured by chemical tests.

CLASSIFICATION.—On the basis of the characteristics observed by the survey team or determined by laboratory tests, soils are classified in phases, types, and series. The soil type is the basic unit of classification. A soil type may consist of several phases. Types that resemble each other in most characteristics are grouped in soil series.

Soil type.—Soils similar in kind, thickness, and arrangement of horizons, and having essentially the same texture in the surface soil, are classified as members of one soil type.

Soil phase.—Soil types are frequently divided into phases because of differences other than those in kind, thickness, and arrangement of horizons. Frequently, these differences are significant in managing the soil. Among the characteristics that suggest dividing a soil type into phases are variation in slope, frequency of rock outcrop, degree of erosion, depth of soil over subsoil, and depth to parent material.

In this survey, many phases are differentiated on the basis of slope, as follows:

Slope:	*Phase*
0 to 2 percent	Level.
2 to 5 percent	Very gently sloping.
5 to 8 percent	Gently sloping.
8 to 12 percent	Sloping.
12 to 17 percent	Strongly sloping.

Other phases are differentiated on the basis of degree of erosion, as follows:

Eroded: Soil has eroded to the extent that ordinary tillage implements would extend through the remaining surface soil and into the subsoil. The remaining surface soil is generally 2 to 5 inches thick. Gullies that are easy to cross with farm machinery may be included.

Severely eroded: Soil eroded to the extent that almost all, or all, of the surface soil has been removed, and in places much of the subsoil has been lost. Some areas have numerous shallow gullies. Gullies too deep to cross with farm machinery are also common in some areas.

The soil phase (or the soil type if it has not been divided into phases) is the unit shown on the soil map. It is the unit that has the smallest range of characteristics. Use and management, therefore, can be related more specifically than for broader groups of soils that necessarily contain more variation.

Soil series.—Two or more soil types that are similar in kind, thickness, and arrangement of soil layers are normally designated as a soil series. In some places, however, a soil series may be represented by only one soil type. Soil series normally are named for a place near which they were first mapped.

Miscellaneous land types.—Areas that have little true soil are not classified in types, phases, or series; they are identified by descriptive names. For example, in Escambia County, there are Mixed alluvial land, poorly drained; Fresh water swamp; Gullied land; Pits, dumps, and made land; and several other miscellaneous land types.

Undifferentiated groups.—If two or more soils that normally do not occur in regular geographic association are so intricately mixed that separate mapping is impractical, the soils are mapped together as an undifferentiated group. The group is named for soils in it. Examples in Escambia county are: Lakeland, Ruston, and Norfolk soils; Sunsweet, Carnegie, and Cuthbert soils; and Portsmouth, Grady, and Bayboro soils.

DEFINITIONS.—Some of the terms used in describing soils have been defined or partially defined in this section. More detailed definitions of these terms and of other terms commonly used in soil science will be found in the glossary.

Soil Series and Their Relations

To make full use of this soil survey, it is necessary to know how the soils are related. These relationships are more easily understood if the soils are placed in groups according to their topographic position. The soils of this county have been placed in three such groups: (a) Soils of the uplands, (b) soils of the stream terraces, and (c) soils of the first bottoms.

The methods of classifying and mapping the soils are described in the section, How Soils are Mapped and Described.

Each soil series occupies a characteristic position on the landscape and has its own kind of parent material and other factors important to its use. These are summarized in a tabulation, Soil Series of Escambia County, Florida: Summary of Important Characteristics, at the end of this report.

The soils of Escambia County differ in color, texture, consistence, acidity, fertility, relief, drainage, permeability, and other characteristics. These affect the productivity and the ease with which the soils can be worked and conserved. Accordingly, they affect the uses to which the soils are suited and the requirements for their proper management. In the following paragraphs, the range is indicated for several important characteristics of the soils.

Parent material.—The soils of this county developed in a humid, warm-temperate climate from parent materials classified in two groups: (a) Moderate to thick beds of acid sands and loamy sands, and (b) beds of acid sandy loams, sandy clay loams, sandy clays, and clays.

Relief and erosion.—The soils are mostly level to very gently sloping, but some are strongly sloping. About a third of the soils—those that are on slopes—are eroded or tend to erode without good management.

Texture and structure.—The surface soils range from sand to loam in texture; the subsoils, from sand to clay. The structure of the surface soils varies from single grain to crumb; the structure of the subsoils, from single grain to subangular blocky.

Drainage and organic matter.—The well-drained sands and loamy sands hold little moisture for plants; the soils of finer texture hold more. Many of the soils in this county are water saturated most of the time; some are continuously ponded.

The well-drained soils contain very little organic matter, whereas the somewhat poorly and poorly drained soils generally contain more. Organic matter is important in soil formation and in management of soils. Many properties of the soil—chemical, physical, and biological—are influenced by organic matter to a degree quite disproportionate to the small amount present in the soil.

Fertility.—The natural fertility of these soils is low. However, soils that have a finer texture and a well-developed subsoil respond well to fertilization and other good management practices. They retain plant nutrients and moisture better than the deep, sandy soils.

Soils of the Uplands

The soils of the uplands lie above the stream valleys. They have developed from unconsolidated beds of sand, loamy sand, sandy loam, and sandy clay loam Coastal Plain materials that accumulated on the ocean bottom when this area was covered by the sea during geological time.

The topography ranges from that of a smooth surface dissected by shallow streams, in the southern part of the county, to that of a more strongly sloping surface deeply dissected by streams, in the northern part. Many different soils have developed on the varied relief and over the diverse kinds of parent material. The soils of the uplands differ primarily in color, texture, consistence, structure, and drainage.

Dark-colored, well-drained soils developed from the sandy loam, sandy clay loam, and sandy clay materials

RED BAY: The soils of this series have a dark grayish-brown to dark reddish-brown surface soil and a yellowish-red to red sandy clay loam subsoil.

BLAKELY: These soils differ from Red Bay in having a darker reddish-brown color in all horizons.

CARNEGIE: These soils have pebbles or iron concretions throughout the profile and are less red than the Red Bay soils.

RUSTON: These soils have more sand throughout the profile than the Faceville soils.

FACEVILLE: The soils in this series are less red throughout than the Red Bay soils.

Light-colored, well-drained soils developed from beds of unconsolidated sandy loams, sandy clay loams, and sandy clays

NORFOLK: These soils have a surface soil that ranges from very dark gray to grayish brown; the subsoil is a yellow to brownish-yellow friable fine sandy clay loam.

TIFTON: These soils differ from the Norfolk soils by having many iron concretions, in being slightly browner, and in containing more fine-textured materials throughout the profile.

SAVANNAH: These soils resemble the Norfolk soils; they differ mainly in their tendency toward development of a pan in the lower horizons.

Soils derived from sandy clay and clay parent materials

CUTHBERT: These soils have a dark grayish-brown to grayish-brown surface soil that is underlain by a reddish-yellow, mottled with red and gray, firm fine sandy clay.

ANGIE: Unlike the Cuthbert, the Angie soils have 6 to 12 inches of unmottled, yellow subsoil.

SUNSWEET: The depth to fine sandy clay loam is less in these soils than in the Cuthbert and Angie soils.

Dark-gray, somewhat poorly drained soils derived from sandy loam, sandy clay loam, and sandy clay materials

LYNCHBURG: The surface soil of this series ranges from very dark gray to dark grayish brown; the subsoil consists of brownish-yellow, friable fine sandy clay loam that is mottled in the lower part with yellow, pale yellow, and strong brown.

IRVINGTON: Throughout the profile, these soils are somewhat finer textured than the Lynchburg, and they contain numerous iron concretions.

Poorly drained soils developed from sandy clay and clay formations

GRADY: The surface soil is a dark-gray loam, and the subsoil is a gray, firm silty clay that is prominently mottled with brownish yellow and red.

PORTSMOUTH: These soils have a black loam surface soil and a grayish-brown, firm fine sandy clay loam subsoil that is mottled with brownish yellow, strong brown, and gray.

BAYBORO: These soils have a black fine sandy loam surface soil and a subsoil that resembles the subsoil of the Portsmouth soils.

Light-colored sands and loamy sands that are underlain by finer textured materials at depths greater than 42 inches

LAKELAND: Soils of this series have a thin, dark grayish-brown surface soil that is underlain by a brownish-yellow subsoil.

EUSTIS: A darker surface soil and a reddish-yellow subsoil distinguish these soils from the Lakeland soils.

LAKEWOOD: These soils differ from Lakeland and Eustis soils because they have a light-gray surface soil, then 12 to 15 inches of loose white sand, and, finally, brownish-yellow layers beginning at a depth of approximately 16 inches.

Somewhat poorly drained sands that are underlain by finer textured materials at depths greater than 42 inches

KLEJ: The surface soil of this series varies from dark gray to very dark grayish brown and is underlain by layers of yellowish-brown to brownish-yellow sand or loamy sand that are mottled with yellowish red, strong brown, and yellow. Lenses of white sand occur in the lower parts of the profile.

LEON: These soils differ from Klej soils in having an organic-matter stained pan and in lacking yellow coloring above this layer.

Poorly drained and very poorly drained soils that are underlain by finer textured materials at depths greater than 42 inches

PLUMMER: These soils have a very dark gray to gray surface soil that is underlain by light-gray to grayish-brown sandy materials.

RUTLEGE: The soils of this series contain a greater amount of organic matter than the Plummer and, therefore, are darker colored throughout the profile.

PAMLICO: These soils differ from the Plummer and Rutlege in having a black muck surface soil that varies in thickness and rests on a black mucky sand.

Soils of the Stream Terraces

The soils of the stream terraces developed from Coastal Plain materials deposited by the adjacent streams during

periods of overflow when the streambed was at a higher elevation. Now, these materials are above the overflow stage of the present streams and are called terraces, old general stream alluvium, second bottoms, or benches. The soils of the stream terraces differ chiefly in texture and drainage. The soils of the terraces—Huckabee, Barth, Kalmia, Izagora, Stough, Wahee, and Myatt—occur along the larger streams.

Well-drained to somewhat poorly drained loamy fine sands with a dark grayish-brown surface soil and a brownish-yellow subsoil that is underlain by finer textured materials at depths greater than 42 inches

BARTH: These soils differ from Huckabee primarily in being somewhat poorly drained and in having distinctly mottled horizons in the lower subsoil.

HUCKABEE: These soils are well drained. They have a dark grayish-brown surface layer and a brownish-yellow subsoil that is not mottled.

Moderately well drained to well drained soils derived from sandy loam to sandy clay materials

KALMIA: The soils of this series have a dark grayish-brown fine sandy loam surface soil and a brownish-yellow, friable fine sandy clay loam subsoil.

IZAGORA: These soils differ from the Kalmia soils primarily because they have finer textured parent materials and exhibit light-gray, strong-brown, and red mottlings at a depth of approximately 28 inches.

Somewhat poorly drained soils that have developed from sandy clay to clay terrace materials

WAHEE: These soils have a dark grayish-brown fine sandy loam surface soil and a mottled light brownish-gray, brownish-yellow, and red, firm clay subsoil.

STOUGH: The surface soil of this series is a dark-gray fine sandy loam; the subsoil is a brownish-yellow friable sandy clay loam with mottlings of yellow, strong brown, and gray.

Poorly drained soils that developed from sandy loam to sandy clay loam terrace materials

MYATT: The surface soil for this series is a light brownish-gray very fine sandy loam; the subsoil is a mottled light grayish-brown, brownish-yellow, reddish-yellow, and strong-brown, friable fine sandy clay loam.

Soils of the First Bottoms

The nearly level areas sometimes overflowed and flooded by streams are called first bottoms. They generally are only a few feet above the streams. From higher lying lands, streams have carried down materials that make up the first bottoms. The characteristics of the soils result largely from the source of the materials and the speed at which the water was moving when the materials were deposited. The first bottoms were recently formed, and the materials have not lain in place long; consequently, the soils do not have well-defined surface soil and subsoil layers such as those to be seen in most soils of the uplands.

500032—60——2

Mixture of dissimilar materials

MIXED ALLUVIAL LAND, POORLY DRAINED: This miscellaneous land type is not used to produce crops, because of the risk of periodic flooding.

MIXED LOCAL ALLUVIAL LAND, MODERATELY WELL DRAINED: This soil is not used for cultivated crops, but it could be if runoff from adjacent soils were controlled.

Soil Descriptions

This section is provided for those who want detailed information about soils. It describes each soil, or mapping unit, in this county; that is, the areas on the detailed soil map that are bounded by lines and identified by a letter symbol. For more general information about the soils, the reader can refer to the section, Soil Associations, in which broad patterns of soils are described.

In this section the soils are described approximately in alphabetic order. All the soils of one series that have the same texture in the surface layer are together. For example, all Eustis soils that have a loamy fine sand surface soil come together, then all Eustis soils that have a loamy sand surface soil, and finally all Eustis soils that have a sand surface soil.

The acreage and proportionate extent of each soil mapped are shown in table 3.

Some of the terms used in describing soils have special meaning in soil science. Many of these terms are defined in the glossary at the back of this report.

Angie Series

The soils of the Angie series have a grayish-brown surface soil and yellow subsoil. They were derived from beds of sandy clays and clays. They are associated with the undifferentiated unit of Sunsweet, Carnegie, and Cuthbert soils but are less well drained and contain yellow instead of strong-brown or yellowish-red subsoil. Surface runoff is mostly medium, and permeability of the subsoil is slow. These soils are acid throughout the profile.

Angie fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Aa; IIe–3).—This soil, the only Angie soil mapped in the county, occurs mainly in the northern part. The areas are small and irregular. The native vegetation consists primarily of longleaf pine and several species of oak.

Profile description:

0 to 4 inches, grayish-brown fine sandy loam; friable; weak fine crumb structure.
4 to 10 inches, light yellowish-brown fine sandy loam; friable; weak fine crumb structure.
10 to 20 inches, yellow fine sandy clay loam; firm; moderate medium subangular blocky structure.
20 to 36 inches, yellow fine sandy clay loam with red and gray mottles; firm; moderate medium subangular blocky structure.
36 to 42 inches, fine sandy clay mottled with gray, yellow, and red; firm; moderate medium subangular blocky structure.

The surface soil varies from very dark gray to grayish brown in color and from 4 to 6 inches in thickness. The subsoil is olive yellow to brownish yellow, with red

TABLE 3.—*Approximate acreage and proportionate extent of the soils mapped in Escambia County, Florida*

[Acreages estimated from count of approximately 55 percent of the county by the grid method]

Soil	Area	Extent
	Acres	*Percent*
Angie fine sandy loam, very gently sloping phase	150	(1)
Barth loamy fine sand	520	0. 1
Blakely loam	180	(1)
Carnegie fine sandy loam, level phase	560	. 1
Carnegie fine sandy loam, very gently sloping phase	7, 700	1. 8
Carnegie fine sandy loam, eroded very gently sloping phase	160	(1)
Carnegie fine sandy loam, gently sloping phase	1, 050	. 3
Carnegie fine sandy loam, eroded gently sloping phase	160	(1)
Coastal dune land and beach	9, 100	2. 2
Eustis loamy fine sand, level phase	500	. 1
Eustis loamy fine sand, very gently sloping phase	7, 900	1. 9
Eustis loamy fine sand, gently sloping phase	2, 400	. 6
Eustis loamy fine sand, sloping phase	1, 600	. 4
Eustis loamy sand, level phase	4, 900	1. 2
Eustis loamy sand, very gently sloping phase	7, 000	1. 7
Eustis loamy sand, gently sloping phase	1, 600	. 4
Eustis loamy sand, sloping phase	850	. 2
Eustis sand, level phase	3, 200	. 8
Eustis sand, very gently sloping phase	750	. 2
Eustis sand, sloping phase	200	(1)
Faceville fine sandy loam, level phase	1, 500	. 4
Faceville fine sandy loam, very gently sloping phase	465	. 1
Fresh water swamp	650	. 2
Grady loam	2, 000	. 5
Gullied land	800	. 2
Huckabee loamy fine sand, level phase	750	. 2
Huckabee loamy fine sand, very gently sloping phase	600	. 1
Irvington fine sandy loam	5, 300	1. 3
Izagora fine sandy loam	450	. 1
Kalmia fine sandy loam, level phase	1, 650	. 4
Kalmia fine sandy loam, very gently sloping phase	1, 220	. 3
Klej loamy sand, level phase	650	. 2
Klej loamy sand, very gently sloping phase	450	. 1
Klej sand, level phase	3, 900	. 9
Klej sand, very gently sloping phase	170	(1)
Lakeland loamy fine sand, level phase	1, 380	. 3
Lakeland loamy fine sand, very gently sloping phase	2, 300	. 5
Lakeland loamy fine sand, gently sloping phase	950	. 2
Lakeland loamy fine sand, sloping phase	410	. 1
Lakeland loamy sand, level phase	13, 600	3. 2
Lakeland loamy sand, very gently sloping phase	14, 900	3. 5
Lakeland loamy sand, gently sloping phase	7, 800	1. 8
Lakeland loamy sand, sloping phase	3, 100	. 7
Lakeland sand, level phase	11, 500	2. 7
Lakeland sand, very gently sloping phase	2, 000	. 5
Lakeland sand, gently sloping phase	750	. 2
Lakeland sand, sloping phase	650	. 2
Lakeland, Ruston, and Norfolk soils, very gently sloping phases	3, 390	. 8
Lakeland, Ruston, and Norfolk soils, gently sloping phases	6, 500	1. 5
Lakeland, Ruston, and Norfolk soils, eroded gently sloping phases	38, 100	9. 0
Lakeland, Ruston, and Norfolk soils, eroded sloping phases	25, 400	6. 0
Lakeland, Ruston, and Norfolk soils, eroded strongly sloping phases	1, 500	. 4
Lakewood sand, level phase	1, 100	. 3
Lakewood sand, very gently sloping phase	470	. 1
Leon sand	2, 800	0. 7
Leon sand, light colored surface phase	230	. 1
Lynchburg gravelly very fine sandy loam	1, 700	. 4
Lynchburg fine sandy loam, level phase	580	. 1
Lynchburg fine sandy loam, very gently sloping phase	1, 030	. 2
Mixed alluvial land, poorly drained	61, 200	14. 5
Mixed local alluvial land, moderately well drained	640	. 2
Myatt loamy fine sand, thick surface phase	650	. 2
Myatt very fine sandy loam, level phase	1, 950	. 5
Myatt very fine sandy loam, very gently sloping phase	550	. 1
Norfolk fine sandy loam, level phase	9, 100	2. 2
Norfolk fine sandy loam, very gently sloping phase	9, 500	2. 3
Norfolk fine sandy loam, gently sloping phase	1, 600	. 4
Pamlico muck	100	(1)
Pits, dumps, and made land	650	. 2
Plummer fine sand	700	. 2
Plummer loamy sand, level phase	6, 400	1. 5
Plummer loamy sand, very gently sloping phase	17, 700	4. 2
Plummer sand	670	. 2
Portsmouth loam	200	(1)
Portsmouth, Grady, and Bayboro soils	7, 300	1. 7
Red Bay fine sandy loam, level phase	11, 200	2. 7
Red Bay fine sandy loam, very gently sloping phase	2, 300	. 6
Red Bay fine sandy loam, gently sloping phase	270	. 1
Red Bay loamy fine sand, level thick surface phase	275	. 1
Red Bay loamy fine sand, very gently sloping thick surface phase	700	. 2
Red Bay loamy fine sand, gently sloping thick surface phase	300	. 1
Rough broken land	600	. 1
Ruston fine sandy loam, level phase	2, 000	. 5
Ruston fine sandy loam, very gently sloping phase	9, 700	2. 3
Ruston fine sandy loam, gently sloping phase	1, 000	. 2
Ruston loamy fine sand, level thick surface phase	330	. 1
Ruston loamy fine sand, very gently sloping thick surface phase	1, 450	. 3
Ruston loamy fine sand, gently sloping thick surface phase	500	. 1
Rutlege sand	12, 900	3. 1
Savannah fine sandy loam, level thick solum phase	3, 400	. 8
Savannah fine sandy loam, very gently sloping thick solum phase	4, 700	1. 1
Stough fine sandy loam	350	. 1
Sunsweet, Carnegie, and Cuthbert soils, very gently sloping phases	1, 200	. 3
Sunsweet, Carnegie, and Cuthbert soils, gently sloping phases	130	(1)
Sunsweet, Carnegie, and Cuthbert soils, eroded sloping phases	5, 800	1. 4
Sunsweet, Carnegie, and Cuthbert soils, severely eroded sloping phases	350	. 1
Tidal marsh	1, 400	. 3
Tifton fine sandy loam, level phase	20, 500	4. 9
Tifton fine sandy loam, very gently sloping phase	6, 000	1. 4
Tifton fine sandy loam, gently sloping phase	950	. 2
Wahee very fine sandy loam	90	(1)
Total	420, 480	100. 0

[1] Less than 0.1 percent.

and gray in the lower horizons. Depth to the layer of firm fine sandy clay loam varies considerably, and in places the soil is friable to a depth of approximately 22 inches. A few very small areas that have been affected by erosion are included with this soil.

Use and management.—This soil is of little agricultural importance because of its small acreage in the county. None of it is being used for cultivated crops. Where surface runoff is properly controlled, it is suitable for corn, cotton, soybeans, small grains, and pasture. If productivity is to be brought to a reasonably high level, it is necessary to add organic matter and apply lime and complete fertilizers liberally.

Most of this soil is used for woodland pasture. Some longleaf pine grows in the pasture. Where the soil is to be used exclusively for forestry, and enough seed trees remain to insure reseeding, good stands of longleaf pine will grow if they are protected from fires and grazing and selective cutting is practiced.

Barth Series

Soils of the Barth series were formed from moderately thick beds of sand and loamy sands washed principally from upland soils. They occupy level to nearly level positions on terraces along the larger streams. Barth soils are associated with the Kalmia, Stough, and Myatt soils. They differ from the Kalmia and Stough soils primarily because they contain soil materials of less fine texture throughout the profile. The Barth soils are better drained than the Myatt soils and contain more yellow and less gray in the subsoil. Textures throughout the solum of Barth loamy fine sand are quite similar to those of the thick surface soil of Myatt loamy fine sand. Surface runoff on the Barth soils is slow; internal drainage, slow to medium. These soils contain only a small amount of organic matter and are acid throughout. One soil of the Barth series is mapped in this county.

Barth loamy fine sand (0 to 2 percent slopes) (Ba; IIIs–2).—This soil occurs as small, narrow strips. It is in somewhat poorly drained positions on nearly level terraces along the Perdido River in the southwest and along the Escambia River in the northeast. The native cover consists of longleaf and slash pines, sweetgum, several species of oak, and waxmyrtle.

Profile description:

0 to 6 inches, very dark gray loamy fine sand; very friable; very weak fine crumb structure.
6 to 12 inches, light olive-brown loamy fine sand; very friable; very weak fine crumb structure.
12 to 24 inches, yellow loamy fine sand with pale-yellow mottles; very friable; very weak fine crumb structure.
24 to 42 inches, yellow loamy fine sand with many, distinct, medium, pale-yellow, strong-brown, and olive-yellow mottles; very friable; very weak fine crumb structure.

The surface soil varies from very dark gray to dark gray in color and from 4 to 6 inches in thickness. The subsoil ranges from light yellowish brown to pale yellow, but the texture is rather uniformly a very friable loamy fine sand. Included with this soil are a few areas on very gentle slopes and a few small areas that have materials of finer texture beginning at a depth between 30 and 42 inches.

Use and management.—Barth loamy fine sand is important to agriculture only locally. The soil is somewhat poorly drained and remains nearly saturated during rainy seasons. It is best suited to forest and pasture. If it is cleared and drained, fairly good improved pasture can be obtained. After the grass has been established, moderate amounts of lime are needed, as well as liberal, frequent applications of complete fertilizer, because this soil loses plant nutrients through leaching.

Most of the soil is in forest and woodland pasture. Fire control and the selective cutting of timber encourage the growth of pines.

Blakely Series

The soils of the Blakely series were derived from thick beds of sandy loam to sandy clay. They have a thick, dark reddish-brown surface soil and a red subsoil that contains a high percentage of silt and clay. These soils occur in nearly level depressions among the Red Bay soils. They differ from the Red Bay soils in having a thicker dark reddish-brown surface soil and a darker shade of red in the subsoil, and in containing slightly higher percentages of silt and clay.

The Blakely soils are acid throughout the profile. They are well drained, moderately to rapidly permeable in the surface soil, and moderately permeable in the subsoil. One soil of this series was mapped.

Blakely loam (0 to 2 percent slopes) (Bb; I–1).—This soil occurs in the northern part of the county. The native forest is a mixture of hardwoods and a few scattered pines. The hardwoods, in most places, are large and in a thick stand.

Profile description:

0 to 10 inches, dark reddish-brown loam; friable; moderate fine crumb structure.
10 to 15 inches, dark reddish-brown loam; friable; moderate fine and medium crumb structure.
15 to 24 inches, red fine sandy clay loam; friable to firm; moderate medium subangular blocky structure.
24 to 42 inches, red fine sandy clay loam; firm; moderate medium subangular blocky structure.

The surface soil varies from dark reddish brown to brown in color and from 10 to 14 inches in thickness. The subsoil is a dark-red to red, firm fine sandy clay loam. Weathering has affected this soil to a great depth. In most areas the subsoil differs little in color, texture, consistence, and structure within depths of 24 to 60 inches.

Use and management.—This soil contains very small quantities of organic matter and plant nutrients. Nevertheless, good tilth can be established and easily maintained. Fairly high productivity can be built up and maintained if moderate amounts of lime are added and liberal quantities of nitrogen, phosphate, potash, and organic matter are added. Growing of winter legumes will improve productivity.

All of this soil has been cleared of native vegetation and is in constant use for field crops and pasture. Good yields of corn, cotton, soybeans, oats, and wheat are common. Ordinarily, potatoes are not grown. Pastures are generally kept for only brief periods because this is one of the most desirable soils in the county for field crops.

Carnegie Series

The soils of the Carnegie series were derived from sandy clay loam and sandy clay. Small, smooth, rounded, brown or reddish-brown, hard iron concretions are abundant on and throughout the surface soil but are less numerous in the subsoil. The surface soil is dark brown to dark gray, and the subsoil is yellowish red to red.

These soils are associated with the soils of the Tifton, Faceville, and Savannah series. They differ from the Tifton soils primarily in having a redder subsoil, from Faceville soils in having many iron concretions on the surface and within the profile, and from the Savannah soils in containing iron concretions and being more red in the subsoil.

Carnegie soils are well drained; permeability is moderate in the surface soil and moderate to slow in the subsoil. The soils are acid throughout the profile. Although their content of organic matter and natural fertility are both low, the Carnegie soils are well suited to most of the crops commonly grown in the area. Productivity can be improved considerably by good management.

Carnegie fine sandy loam, level phase (0 to 2 percent slopes) (Ca; I–2).—This soil, one of the least extensive in the Carnegie series, is confined to the central and northern parts of the county. It occurs on nearly level parts of broad ridges. It is closely associated with other soils of the Carnegie series. This soil originally had a heavy growth of longleaf pine and hardwoods, but the timber has been removed from all except a few small areas.

Profile description:

0 to 6 inches, dark-brown fine sandy loam; friable; weak fine crumb structure.
6 to 10 inches, strong-brown fine sandy loam; friable; weak fine crumb structure.
10 to 18 inches, yellowish-red fine sandy loam; friable; moderate medium crumb structure.
18 to 30 inches, red fine sandy clay loam; friable to firm; moderate medium and fine subangular blocky structure.
30 to 42 inches, yellowish-red fine sandy clay loam faintly mottled with reddish yellow and red; friable to firm.

Small, rounded, brown or reddish-brown iron concretions are numerous on and throughout the surface soil; they are present in smaller numbers in the subsoil. The concretions that make up 10 to 25 percent of the soil mass in most places are most numerous at depths of 6 to 18 inches. The surface layer varies from brown to dark brown in color and from 5 to 8 inches in thickness. In most areas the yellowish-red to red subsoil contains mottles at depths below 30 inches. The mottles vary in abundance, size, and contrast. Included with this soil are some areas affected by erosion and some small areas that have a reddish-yellow subsoil.

Use and management.—This soil, one of the most desirable in the county, is well drained and permeable to both roots and moisture. It is easy to cultivate, can be worked soon after rains, and has characteristics that favor keeping it in good tilth. The fine texture of the subsoil helps retain moisture and plant nutrients. The soil is well suited to intensive use, although there is slight risk of erosion when it is cultivated.

Most of this soil has been cleared of trees and is used for row crops, small grains, and pasture. Where adequate lime and fertilizer have been applied, the legumes and grasses desirable for pasture provide abundant grazing of high quality. Lime is required in moderate amounts. Crops respond well if nitrogen, phosphate, potash, and organic matter are applied. Winter legumes turned under before the spring planting aid greatly in maintaining productivity. This soil is suited to many crops. Most farmers consider it to be one of the best soils in the county for cotton. Good yields of corn and soybeans are common.

Carnegie fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Cb; IIe–2).—This soil is similar to the level phase of Carnegie fine sandy loam. It occurs in close association with other Carnegie soils. Some small areas that have yellowish-red subsoil and many slightly eroded areas are included with this soil.

Use and management.—Because it has slightly stronger slopes, this soil needs somewhat more exacting management than the level phase. Growing cover crops for green manure is essential if productivity is to be maintained at a reasonably high level. Intensively used areas on stronger slopes need some simple management for controlling runoff and erosion.

Carnegie fine sandy loam, eroded very gently sloping phase (2 to 5 percent slopes) (Cc; IIe–2).—This soil has eroded to the extent that ordinary tillage reaches into the subsoil. In places all of the original surface soil and part of the subsoil have been removed. There are a few small gullies in most areas. This soil occurs in close association with other soils of the Carnegie series. In some very small areas on the lower parts of slopes, the surface soil consists of material washed from nearby areas.

Use and management.—This soil is of minor agricultural importance because of its small acreage. Most of it has been used for tilled crops at some time, but much of the cultivated acreage is now abandoned. Some of the abandoned land is still free of trees. This eroded soil will produce good yields if good crop rotations are used that include cover crops for green manure. It is well suited to improved pasture. Good results can be obtained by alternating pasture and tilled crops.

This soil is more difficult to work and has poorer tilth and more rapid runoff than the very gently sloping phase of Carnegie fine sandy loam.

Carnegie fine sandy loam, gently sloping phase (5 to 8 percent slopes) (Cd; IIIe–2).—This soil is similar to the level phase of Carnegie fine sandy loam. Almost all of it occurs in narrow bands near areas of Carnegie fine sandy loam, level phase, or on slopes adjacent to the soils of the Tifton series. The larger and more typical areas are in the northern part of the county. A considerable part of the soil has been affected by sheet erosion and occasional gully erosion. Small spots that have lost most of the surface soil are common along the upper slopes. Some small areas that have a yellowish-red subsoil and almost no iron concretions have been included in mapping.

Use and management.—Most of this soil is in cutover forest. The native vegetation provides poor grazing for cattle. If the soil is cleared and placed in cultivation, it is necessary to provide erosion controls immediately. Crop rotation, contour cultivation, and terraces are needed if this soil is cultivated. Although this is a little more difficult to work and conserve than the level phase,

it responds well if lime and fertilizer are applied and the content of organic matter is increased. Crops normally yield somewhat less than on the level phase, but if fertility is kept high, pasture of good quality can be produced. The most common agricultural use is for permanent pasture. Rotation of improved pasture and tilled crops is used on many farms with good results.

Carnegie fine sandy loam, eroded gently sloping phase (5 to 8 percent slopes) (Ce; IIIe–2).—This soil differs from Carnegie fine sandy loam, level phase, in having stronger slopes, more rapid runoff, a thinner profile, and greater susceptibility to erosion. It is so eroded that ordinary tillage reaches into the subsoil. In places all of the original surface soil and parts of the subsoil have been removed. A few gullies occur at intervals of about 150 feet, but in most places they can be crossed with ordinary farm machinery. Normally, this soil occurs in close association with other soils of the Carnegie series.

Use and management.—This soil is of minor agricultural importance because of the small total acreage. The greater part of the acreage that has been cleared and used for crops is now abandoned and may still be free of trees. Some of the soil remains under cutover forest and furnishes poor grazing for cattle. Satisfactory permanent pasture can be established if erosion is checked and a high level of management is practiced.

Erosion has impaired the workability, tilth, and ability of the soil to absorb and hold moisture. The soil is therefore less suitable for crops than Carnegie fine sandy loam, gently sloping phase. Careful management is needed to maintain its productivity and to control erosion.

Coastal Dune Land and Beach

This land type (Cf; VIII–1) is sand deposited by wave action along the coast. Some of it was reworked by winds that drifted it back some distance from the shore and formed a range of low sand dunes. It occurs as long, narrow strips along bays, lagoons, and the Gulf of Mexico. Santa Rosa Island and similar larger areas contain many small depressions and ponded areas where water covers the surface many months of the year. In contrast to the white sands that occur throughout the entire profile of the more typical areas, these depressions accumulate a very thin layer of organic matter. Many areas are barren. Those not washed by waves have a sparse growth of plants that are tolerant of salt. A scattering of pine and scrub oak grows along inner dunes.

Use and management.—This land type has no agricultural value. An increasing acreage of the dune land is being used for building sites. The beaches provide public recreational facilities.

Eustis Series

The soils of the Eustis series have dark-brown to dark grayish-brown surface soil and yellowish-brown to reddish-yellow subsoil. These soils of the uplands were formed from moderately thick beds of acid marine sands and loamy sands overlying finer sediments. They occur with Ruston and Lakeland soils. From the Ruston soils they differ in containing loose sandy materials to a depth greater than 30 inches, and from the Lakeland soils, in containing reddish-yellow subsurface horizons.

The Eustis soils are somewhat excessively drained; the permeability of the subsoil is very rapid. These acid, sandy soils are very porous and lose essential plant nutrients through oxidation and leaching. The Eustis soils are not extensively used for cultivated crops.

Eustis loamy fine sand, level phase (0 to 2 percent slopes) (Ea; IIs–1).—This soil has a dark-brown to dark grayish-brown surface soil that grades to reddish-yellow loamy fine sand in the subsoil. The most typical and most extensive areas of this soil are in the northern part of the county. The native vegetation consists of turkey and blackjack oaks, scattered longleaf pine, dogwood, and a scant growth of various grasses.

Profile description:

0 to 4 inches, dark grayish-brown loamy fine sand; very friable; contains small amounts of organic matter.
4 to 12 inches, yellowish-brown loamy fine sand; very friable.
12 to 42 inches +, reddish-yellow loamy fine sand; very friable.

The surface soil varies from 3 to 6 inches in thickness. Below a depth of 42 inches, and generally within a depth of 72 inches, the soil is underlain by materials of finer texture. In a few small areas the finer textured materials begin at 30 to 42 inches. These areas are normally adjacent to the soils of the Ruston series and are not large enough to be shown separately on the soil map.

Use and management.—This sandy porous soil does not naturally hold sufficient moisture and plant nutrients for large yields of cultivated crops. Water rapidly penetrates beyond the reach of ordinary plant roots and severely leaches the soil. The supply of moisture is often critical during much of the growing season. Erosion is negligible because of the gentle slopes and the capacity of the soil to absorb water readily. Crop yields can be greatly improved by using rotations that include green-manure crops frequently. Crop residues and legumes should be turned under.

Many cultivated fields include areas of this soil. Corn, cotton, soybeans, field peas, and sweetpotatoes make good growth in favorable seasons and return fair to good yields. Ordinarily, rain is poorly distributed in the growing season, and frequently there is not enough moisture to produce good yields.

Several hundred acres of this soil have been planted to grasses for improved pasture. Under good management 2 or 3 acres can support a cow. When the reaction of the surface soil drops below pH 5.0, additional lime is needed. Complete fertilizer mixtures need to be applied frequently after the grass has been established because the soil is low in inherent productivity and is susceptible to leaching.

Most of this soil is cutover pineland, and the native cover furnishes poor grazing for cattle. It is moderately well suited to forest, and some good stands of longleaf pine grow in areas protected from fire. Slash pine has been planted in a number of abandoned fields. In the early stages, trees grow better on old fields, where competition from other plants is lower than on the virgin soil. The plantings of pine are cut and marketed locally as pulpwood.

Eustis loamy fine sand, very gently sloping phase (2 to 5 percent slopes) (Eb; IIIs–1).—This soil is similar

to Eustis loamy fine sand, level phase, and is in close association with the other phases of Eustis loamy fine sand. Because it has stronger slopes, runoff is more rapid than on the level phase. This soil includes areas too small to map separately that are affected by sheet and occasional gully erosion.

Use and management.—Although this soil is not quite so easily handled, it is much like the level phase in need for fertilizer, suitability for crops, yields, and present use. If this soil is to be cultivated, it needs protection from erosion. Normally, contour plowing is used to reduce erosion and conserve moisture. Only a very small acreage of this soil has been cleared for cultivation, and much of this has been abandoned. Several stands of slash pine that were planted on the abandoned land are growing well.

Eustis loamy fine sand, gently sloping phase (5 to 8 percent slopes) (Ec; IVs–1).—This soil is undulating. Its profile is similar to that of the level phase of Eustis loamy fine sand. Normally it is on short slopes adjacent to streams and drainageways in the northern part of the county. It includes some small areas affected by sheet erosion and, in places, by gully erosion. The rapid runoff during heavy rains causes some erosion in many areas.

Use and management.—Under careful management this soil produces fairly good pastures; without it, the quality of vegetation is poor, the quantity is small, and the carrying capacity is very low. This soil is not well suited to intensive agricultural use. Only a small acreage has been cleared; much of this is abandoned. Most of the acreage remains in forest. Scattered stands of longleaf pine make good growth where adequate protection from fire has been furnished for years.

Eustis loamy fine sand, sloping phase (8 to 12 percent slopes) (Ed; VIe–2).—This soil is similar to the level phase of Eustis loamy fine sand. It differs chiefly in occupying stronger slopes. It occurs in long, narrow areas adjacent to streams and drainageways in the northern part of the county. This soil includes small areas of Ruston and Cuthbert soils and many areas affected by sheet erosion and, in some places, by gully erosion. These are not large enough to map separately.

Use and management.—Practically none of this soil is farmed. Unless an exceptionally good sod has been established, extreme care is needed to control erosion, even when the soil is used for pasture. A few longleaf pines normally occur on the lower slopes adjacent to the drainageways where the supply of moisture is more favorable for plant growth. Longleaf pine grows more abundantly where adequate protection from fire has been supplied for years. Most of the soil remains in forest, the use to which it is best suited.

Eustis loamy sand, level phase (0 to 2 percent slopes) (Ee; IIs–1).—This soil differs from the level phase of Eustis loamy fine sand primarily because it has more medium and coarse sand grains throughout its profile. This soil occurs on flat, or nearly level, sandy ridges scattered throughout most of the county. The native vegetation consists of turkey and blackjack oaks, a few scattered longleaf pines, and various grasses.

Profile description:

0 to 4 inches, dark grayish-brown loamy sand; very friable; contains small amounts of organic matter.
4 to 12 inches, yellowish-brown loamy sand; very friable.
12 to 42 inches, reddish-yellow loamy sand; very friable.

The surface soil ranges from dark brown to dark grayish brown in color and from 3 to 5 inches in thickness. Materials of finer texture generally occur below 42 inches and within a depth of 72 inches. Some small areas of Eustis sand in the southern part of the county, as well as a few small areas that have materials of finer texture at depths of 30 to 42 inches, are included with this soil because their acreage is too small to map separately.

Use and management.—A very small acreage is being used for cultivated crops. During normal rains there is little runoff, but the rapid permeability of the soil permits extreme leaching. Erosion is negligible because the soil is nearly level and absorbs moisture readily.

Yields from cultivated crops are generally low, but they can be improved considerably if fertilizer is applied liberally and crop residues and legumes are turned under. Corn, cotton, soybeans, and field peas make fair growth and return low to poor yields. Where good management is practiced, the yields depend largely on weather, as the supply of moisture is critical during much of the growing season. Winter cover crops make fair growth on this soil.

Several hundred acres of this soil has been planted to improved pasture grasses. Lime and liberal amounts of fertilizer are necessary to get the pasture started. After the stand is established, additional lime is needed whenever the reaction of the surface soil drops below pH 5.0, and a complete fertilizer must be applied frequently. Under a high level of management, 2 or 3 acres of the improved pasture can support a cow.

Timber grows fairly well on this soil, and there are some good stands of longleaf pine where fire protection has been adequate for years. Some slash pine has been planted in abandoned fields. Young slash pine grows better in the old fields, where competition from other vegetation is low, than on virgin soil. Most of this soil is cutover pineland, and the native cover furnishes poor grazing for cattle.

Eustis loamy sand, very gently sloping phase (2 to 5 percent slopes) (Ef; IIIs–1).—This soil, except for slope, is almost identical with Eustis loamy sand, level phase. It occurs in close association with the other Eustis soils. Some small areas that have been affected by sheet and occasional gully erosion are included with this soil.

Use and management.—In suitability for crops, need of fertilizer, yields, and present use, this soil is about the same as the level phase. Runoff is more rapid, however, and more careful management is needed to reduce erosion and conserve moisture. Contour cultivation, stripcropping, or similar practices are needed. Only a small acreage of this soil has been cleared for cultivation, and a large part of that has been abandoned. Slash pine planted in the abandoned fields is growing well.

Eustis loamy sand, gently sloping phase (5 to 8 percent slopes) (Eg; IVs–1).—This soil has a profile similar to that of the level phase of Eustis loamy sand. Generally, it occurs on short slopes adjacent to streams and drainageways. Some small areas affected by sheet and gully erosion are included with this soil.

During heavy rains, runoff is rapid and many areas are damaged by erosion unless a good cover of grass is

maintained. This soil, therefore, has limited suitability for cultivated crops. Under proper management, however, it can produce good improved pasture. Without good management, the quality of the vegetation is poor.

Scattered stands of longleaf pine make fair growth where they have been protected from fire for years. Most of this soil remains as cutover pineland and furnishes poor grazing for cattle.

Eustis loamy sand, sloping phase (8 to 12 percent slopes) (Eh; VIe–2).—Except for stronger slopes, this soil is much like the level phase of Eustis loamy sand. It is closely associated with other Eustis loamy sands and occurs in long, narrow areas adjacent to streams and drainageways throughout the county. Included with this soil are some small areas of Ruston and Cuthbert soils that are too small to be mapped separately.

Use and management.—The rapid runoff during heavy rains has caused various degrees of erosion. Most areas sparsely covered with vegetation have been affected by sheet erosion and, in places, by gully erosion. For these reasons, this soil is more suitable for forest than for cultivated crops or pasture.

The trees on this soil are mainly turkey oak and blackjack oak. A few longleaf pines grow on some lower slopes adjacent to the drainageways where more moisture is available. Longleaf pine grows much more abundantly in areas that have been adequately protected from fire for years.

Eustis sand, level phase (0 to 2 percent slopes) (Ek; IVs–2).—This soil differs from the level phases of Eustis loamy fine sand and Eustis loamy sand mainly in having, throughout its profile, less material of fine texture and more medium and coarse sand. The thin, dark grayish-brown surface soil grades to the reddish-yellow sand in the subsoil. The soil is on flat, or nearly level, sandy ridges, mostly in the southeastern part of the county. The native vegetation consists of turkey oak and blue-jack oak, a few scattered longleaf pines, and a scant growth of various grasses.

Profile description:

0 to 3 inches, dark grayish-brown sand; loose and single grained; contains small amounts of organic matter.
3 to 10 inches, yellowish-brown sand; loose and single grained.
10 to 42 inches, reddish-yellow sand; loose and single grained.

The surface soil ranges from dark brown to dark grayish brown in color and from 2 to 4 inches in thickness. A number of areas of Lakeland sand not large enough to justify separate mapping are included with this soil.

This soil is extremely porous and very low in inherent fertility; it loses quantities of essential plant nutrients through oxidation and leaching. This soil is poorly suited to crops because it has a low capacity for holding water and is rapidly permeable. It is somewhat excessively drained. Erosion is negligible because the surface soil and subsoil are porous.

Use and management.—This soil is poorly suited to cultivated crops and is only moderately suited to pasture. It is of little agricultural value except for forestry. Scattered longleaf pines make fair to poor growth where adequate protection from fire has been furnished for years. This soil is used to a limited extent for building sites.

Eustis sand, very gently sloping phase (2 to 5 percent slopes) (Em; IVs–2).—Except for stronger slopes and more rapid runoff, this soil is much like the level phase of Eustis sand. It occurs only in the southeastern part of the county and is closely associated with other Eustis sands. This soil includes small areas that have been affected by sheet erosion and, in places, by gully erosion. Also included are a few areas with slopes in excess of 5 percent that were too small to be mapped separately.

This soil loses an excessive amount of moisture because it is rapidly permeable and has little capacity for holding water. Organic matter and other essential plant nutrients are lost readily through oxidation and leaching. Shallow gullies have formed in a few places.

Use and management.—This soil is not suitable for cultivated crops and is poorly suited to pasture. Scattered stands of longleaf pine make fair to poor growth where adequate protection from fire has existed for years. Some of this soil is being used for building sites.

Eustis sand, sloping phase (8 to 12 percent slopes) (En; VIIs–1).—This soil differs from the level phase of Eustis sand mainly in having stronger slopes. It occurs in long, narrow areas adjacent to streams and drainageways in the southeastern part of the county. Sheet erosion has affected most of this soil, and a few areas are gullied.

Use and management.—Low fertility, extreme porosity, and strong slopes limit the use of this soil primarily to the grazing of native plants and to forestry. The tree growth consists mainly of turkey and bluejack oaks and a few scattered longleaf pines. On the lower slopes adjacent to drainageways, where moisture is more available, scattered stands of longleaf pine make poor to fair growth. Longleaf pine grows more abundantly where adequate protection from fire is supplied. This soil is more suitable for forest than for crops or pasture.

Faceville Series

The soils of the Faceville series developed from beds of unconsolidated sandy clay loams and sandy clays. They are generally associated with the Tifton, Carnegie, and Red Bay soils and, in the northern part of the county, with the level thick solum phase of Savannah fine sandy loam.

Faceville soils differ from Tifton soils mainly in having a redder subsoil; from the Carnegie soils, in having much fewer reddish-brown iron concretions; from the Red Bay soils, in containing less red coloring throughout the profile; and from the Savannah soils, in showing more brown coloring in the subsoil.

Faceville soils are well drained. They are moderately permeable in the surface soil and moderately to slowly permeable in the subsoil. They are acid throughout. Although these soils are low in both organic matter and natural fertility, they are suitable for most crops commonly grown in the area.

Faceville fine sandy loam, level phase (0 to 2 percent slopes) (Fa; I–2).—The most typical and extensive areas of this soil are on smooth interstream ridges in the central and northern parts of the county. In the north the soil commonly occurs as long, narrow strips adjacent to the Red Bay soils and between the Red Bay soils and the level thick solum phase of Savannah fine sandy loam.

The original forest consisted largely of longleaf pine and some scattered deciduous hardwoods.

Profile description:

0 to 6 inches, dark grayish-brown fine sandy loam; friable; weak fine crumb structure.
6 to 12 inches, yellowish-brown fine sandy loam; friable; weak medium crumb structure.
12 to 36 inches, yellowish-red fine sandy clay loam; friable to firm; moderate medium subangular blocky structure; contains a few reddish-yellow mottles in lower part.
36 to 42 inches, yellowish-red fine sandy clay loam commonly mottled with reddish yellow; firm; moderate medium subangular blocky structure.

The surface soil varies from dark brown to dark grayish brown in color and from 4 to 8 inches in thickness. The subsoil, a fine sandy clay loam, ranges from yellowish red to strong brown. A few small, rounded, brown or reddish-brown iron concretions are on the surface and within the profile. They are not nearly so numerous as in the soils of the Carnegie and Tifton series. Included with this soil are some small areas that have reddish-yellow subsoils, as well as a few areas that have been slightly eroded.

Use and management.—This is one of the most desirable soils of the county. It is well suited to general farming and, under good management, produces good yields. It is easy to work, absorbs and holds moisture well, and retains plant nutrients. Roots penetrate freely. It is well suited to intensive use, although it is subject to slight erosion when cultivated.

Most of the soil has been cleared of native vegetation and is in constant use for field crops. Corn, cotton, soybeans, and small grains give good yields. Crops respond to liberal fertilization with nitrogen, phosphate, potash, and organic matter. Lime is required in moderate amounts. Winter legumes help build up and maintain a high state of productivity.

This soil is not often used for pasture. Where fertility is kept at a reasonably high level, excellent stands of good-quality forage can be produced. Good management practices—mowing, fertilizing, liming, and reseeding poor stands—help to establish and maintain permanent pasture on this soil.

Faceville fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Fb; IIe–2).—This soil normally occurs in close association with the level phase of Faceville fine sandy loam. Their color, texture, structure, and consistence are similar. Some small areas with reddish-yellow subsoils and a few slightly eroded areas are included with this soil.

Use and management.—Much of this soil has been cleared of native vegetation and is used for crops and pasture. This soil and the level phase have similar management and fertilizer requirements, productivity, and suitability for crops. This soil requires more exacting management than the level phase, particularly the more sloping areas that are lower in plant nutrients and organic matter, slightly lower in ability to hold water, and more susceptible to erosion. Where this soil is to be farmed intensively, steps to control erosion need to be taken immediately after the land is cleared. Although yields normally are slightly lower than those obtained on the level phase, they are almost equal under good management.

Fresh Water Swamp

Fresh water swamp (Fc) consists of naturally wooded areas, all or most of which are covered with water or are saturated throughout the year. The areas contain a mixture of soils and soil materials that vary in color, texture, composition, and thickness of layers. The soil material consists of stratified deposits recently washed from adjacent uplands and so intricately mixed that separation is not feasible. In some places the surface materials resemble those of Rutlege and Plummer sand. In many places organic matter of a varying thickness accumulates in the surface soil. A few areas of organic soils that resemble Pamlico muck have been included with this land type. The largest and most typical areas of Fresh water swamp are in the southwestern part of the county.

Use and management.—All the swampland is covered by a dense growth of bay, cypress, pine, gum, and various plants that grow in water or water-saturated soil. None of this land type is being used for crops or pasture. Improved management of forest would be beneficial in most areas of Fresh water swamp.

Grady Series

The Grady soils were derived from acid sandy clays and clays in upland depressions. They have a dark-gray surface soil and prominently mottled gray subsoil. They are associated with Tifton, Irvington, and Red Bay soils, and with Lynchburg gravelly very fine sandy loam. The Grady soils are more poorly drained than these other soils and have dominantly gray instead of yellow, brownish-yellow, or red subsoil.

Grady soils are poorly drained mainly because they occur in depressions and contain much silt and clay that produces a firm massive clay in the subsoil. Infiltration is slow at the surface. These soils are acid throughout and are low in content of organic matter and in natural fertility. One soil of this series is mapped in the county.

Grady loam (0 to 2 percent slopes) (Ga; Vw–1).—The most extensive areas of this soil occur in the central and northern parts of the county. They are generally in saucerlike depressions and narrow sloughs or intermittent drainageways. The native vegetation consists mainly of blackgum and a thick undergrowth of various herbs and grasses that grow in water or water-saturated soil. In places a few scattered cypress trees and slash pines are also present.

Profile description:

0 to 6 inches, dark-gray loam; friable; moderate medium crumb structure.
6 to 12 inches, gray silty clay loam with common, fine mottles of brownish yellow, strong brown, and red; firm; weak medium subangular blocky structure.
12 to 30 inches, gray silty clay with many, coarse, prominent brownish-yellow and red mottles; firm; massive (structureless).
30 to 42 inches, light-gray silty clay with many, medium, prominent brownish-yellow, yellowish-brown, yellowish-red, and red mottles; firm; massive (structureless).

The surface soil varies from dark gray to dark grayish brown in color and from 4 to 8 inches in thickness. The subsoil, a silty clay, ranges from gray to light brownish gray and is prominently mottled with brownish yellow

and red. The depth to mottled materials varies considerably within short distances, as does the size and abundance of the mottles. A few small areas of fine sandy loam and silt loam are included with this soil.

Use and management.—This soil is best suited to forest and pasture. Only a very small acreage has been cleared (fig. 2). In most places water stands on the surface throughout the rainy season. Where drainage is feasible, excellent improved pasture can be established. Pastures need lime and frequent liberal applications of a complete fertilizer. If high fertility is maintained, legumes and grasses produce pasture of good quality and high carrying capacity.

***Figure 2.*—Soybeans on Grady loam in foreground. Irvington fine sandy loam in background. The Grady soil is poorly drained and is not dependable for crops commonly grown in Escambia County.**

Gullied Land

Gullied land (Gb; VIIe–2) is so cut up by recent gullies that it is nonarable. The soil profiles have been largely destroyed. This land normally is on strong slopes along streams and drainageways. It is widely distributed in the northern part of the county in areas ranging from a few acres to about 30 acres in size. The surface soil has been removed from most of the areas, and gullies of variable depths form an intricate pattern. Nevertheless, some areas between the large individual gullies still have part of the original surface soil. The surface is too rough for the use of ordinary farm machinery.

The exposed soil material ranges from grayish brown to red in color and from loamy fine sand to fine sandy clay in texture. In places it is difficult to determine the nature of the original soil because of erosion. Some of the less severely eroded spots contain Lakeland, Norfolk, Ruston, and Carnegie soils.

Use and management.—An intermittent cover of pine, dogwood, turkey oak, and other hardwoods is common to many areas, but it is not sufficient to arrest erosion. External drainage is very rapid to excessive; consequently, little moisture enters the soil. Diversion ditches along the upper edges of the areas are useful in reducing the amount of runoff water that passes through gullied areas. It is hardly possible to rebuild this land by any method except the slow process of reforestation (fig. 3).

***Figure 3.*—Longleaf pine on Gullied land that has been protected from fire.**

Huckabee Series

The Huckabee soils, which closely resemble the Lakeland soils of the uplands, are on terraces along streams. They lie mostly above overflow. They are sandy and have developed from materials washed from light-colored, acid soils of the uplands. They are associated with the Kalmia, Stough, Myatt, and Barth soils and are the best drained of these soils. They differ from the Kalmia soils primarily in having 30 to 72 inches of loamy fine sand resting on materials of finer texture; from the Stough soils, in having coarser texture throughout the profile and no mottles of yellow, strong brown, or light gray in the lower subsoil; from the Myatt soils, in having a coarser texture and a brownish-yellow subsoil; and from the Barth soil, in not having distinctly mottled horizons in the lower subsoil.

Huckabee soils have a moderate external and rapid internal drainage. They are strongly acid and contain inadequate amounts of organic matter and plant nutrients.

Huckabee loamy fine sand, level phase (0 to 2 percent slopes) (Ha; IIs–1).—This soil has a dark grayish-brown surface layer and brownish-yellow subsoil. It commonly occurs on well-drained, sandy, nearly level areas along the Perdido and Escambia Rivers. The native cover generally consists of turkey oak, longleaf pine, and scattered hardwoods. Hardwoods are dominant in a few areas of lower elevation.

Profile description:

0 to 4 inches, dark grayish-brown loamy fine sand; very friable; weak fine crumb structure.
4 to 12 inches, yellowish-brown loamy fine sand; very friable; weak fine crumb structure.
12 to 42 inches, brownish-yellow loamy fine sand; very friable; weak fine crumb structure.

The surface soil varies from brown to dark grayish brown in color and from 3 to 5 inches in thickness. The subsoil, a loamy fine sand, ranges from yellow to brownish yellow. A few small areas with dark-brown surface soil and strong-brown subsoil are included with this soil. Also included are a few areas with a subsoil of fine texture within less than 30 inches of the surface.

Use and management.—Because of its limited acreage, this soil is of minor agricultural importance. Most of it is used for native range and forest. The slope and porosity of the sandy soil permit a large part of the water to percolate through it and to leach out most of the plant nutrients. It is, therefore, only moderately suited to tilled crops. Improved forest management, particularly protection from fire and selective cutting of trees, proves beneficial.

Huckabee loamy fine sand, very gently sloping phase (2 to 5 percent slopes) (Hb; IIIs–1).—This soil is in close association with and similar to the level phase of Huckabee loamy fine sand. Some small areas with slopes in excess of 5 percent, and a few slightly eroded ones, are included with this soil, as well as a few areas with a dark-brown surface soil and a strong-brown subsoil. In a few places a subsoil with a fine texture occurs at depths of less than 30 inches.

Use and management.—Because of its limited acreage, this soil is of minor agricultural importance. Most of it is used for native range and forest. The slope and porosity of the sandy soil permit a large part of the water to percolate through it and leach out most of the plant nutrients. It is, therefore, only moderately suited to tilled crops. Improved forest management, particularly protection from fire and the selective cutting of trees, proves beneficial.

Irvington Series

The soils of the Irvington series developed from thick beds of unconsolidated, acid sandy clay loams and sandy clays. They have a dark-gray surface soil and yellow subsoil. They contain various quantities of locally formed small, rounded, brown or reddish-brown iron concretions. In places the surface soil is almost covered with them. In other areas they are almost entirely absent. These soils occur on nearly level relief along smooth interstream ridges.

The Irvington soils are associated with Lynchburg gravelly very fine sandy loam, Grady loam, and the soils of the Tifton series. They are somewhat better drained, occupy a slightly higher topographic position, and do not contain so much very fine sand, silt, and clay as Lynchburg gravelly very fine sandy loam. Irvington soils are considerably better drained than the Grady soils and do not have their dominantly gray subsoil. The Irvington soils differ from the Tifton soils primarily in being less well drained.

Irvington soils contain somewhat more organic matter than the better drained soils. Runoff and permeability are slow. One soil of this series was mapped in the county.

Irvington fine sandy loam (0 to 2 percent slopes) (Ia; IIw–1).—Although the acreage is small, this is one of the more important agricultural soils of the county. It occurs only in the northwestern part. The vegetation consists mainly of longleaf pine, gallberry, and a thick growth of various native grasses.

Profile description:

0 to 4 inches, very dark grayish-brown fine sandy loam; friable; weak fine crumb structure.
4 to 10 inches, yellowish-brown fine sandy loam; friable; weak fine crumb structure.
10 to 20 inches, yellow fine sandy clay loam; firm; weak fine subangular blocky structure.
20 to 36 inches, yellow fine sandy clay loam mottled with pale yellow and strong brown; firm; moderate medium subangular blocky structure.
36 to 42 inches, fine sandy clay loam mottled with yellow, pale yellow, and strong brown; firm; moderate medium subangular blocky structure.

The surface soil varies from very dark grayish brown to black in color and from 4 to 7 inches in thickness. The subsoil, a fine sandy clay loam, ranges from pale yellow to brownish yellow and is mottled with strong brown and various shades of yellow. Although the depth to mottling varies within short distances, it generally occurs within depths of 18 to 24 inches. Included with this soil are a few areas with slopes in excess of 2 percent that were too small to be mapped separately.

Use and management.—This soil contains many iron concretions and materials of fine texture; consequently, it tends to clod and cannot be cultivated over as wide a range of moisture content as the Norfolk and Red Bay soils. Shallow open ditches satisfactorily dispose of the excess surface water in most places. Erosion is negligible.

Approximately half of this soil has been cleared for agricultural use. Corn and small grains are commonly grown, but cotton is not. This is one of the most desirable soils for potatoes and soybeans (fig. 4). Soybeans are generally planted after potatoes in the crop rotation. In many instances, little or no fertilizer is applied to soybeans because they use the fertilizer that remains from the preceding crop of potatoes. This soil responds well to heavy fertilization. Organic matter, nitrogen, phosphate, potash, and lime are required.

Figure 4.—**Potatoes on Irvington fine sandy loam, one of the more desirable soils for this crop.**

This soil is very well suited to grasses and legumes for pasture. Where fertilizer and lime are adequately supplied, the more desirable plants produce abundant grazing of a high quality.

Izagora Series

The soils of the Izagora series are on stream terraces and have formed from thin beds of sandy alluvium overlying alluvium of fine texture. These materials were washed from acid upland soils. The Izagora soils are associated with the Kalmia, Wahee, and Myatt soils. The Izagora soils differ from the Kalmia soils primarily in having much finer texture in the lower horizons; from Wahee soils, in being better drained and more friable in the upper part of the subsoil; and from the Myatt, in having better drainage and more yellow throughout the profile.

The Izagora soils are moderately well drained and have slow to moderate permeability. They are strongly acid and rather low in organic matter and in natural fertility. One soil of this series was mapped in the county.

Izagora fine sandy loam (0 to 2 percent slopes) (Ib; IIw–1).—Small irregular bodies of this soil occur in moderately well drained areas along the Escambia River in the northeastern part of the county. This soil more commonly occurs near poorly drained Mixed alluvial land, and it frequently lies between this miscellaneous land type and better drained soils. The native trees are primarily pine, sweetgum, and oak. The undergrowth is generally gallberry and wiregrass.

Profile description:

0 to 6 inches, dark grayish-brown fine sandy loam; friable; weak fine and medium crumb structure.
6 to 12 inches, light yellowish-brown fine sandy loam with shadings of gray and brownish yellow; friable; weak medium crumb structure.
12 to 28 inches, brownish-yellow fine sandy clay loam with a few, faint, fine mottlings of yellowish red; firm; moderate medium subangular blocky structure.
28 to 42 inches, sandy clay with brownish-yellow, light-gray, strong-brown, and red mottles; very firm; moderate medium subangular blocky structure.

The surface soil varies from dark gray to very dark grayish brown in color and from 5 to 8 inches in thickness. The subsoil ranges from light yellowish brown to brownish yellow and contains a few, faint, yellowish-red mottles. A few slightly eroded areas on slopes in excess of 2 percent are included with this soil. Also included are a few areas with brownish-yellow fine sandy clay loam subsoil that were too small to be mapped separately.

Use and management.—This soil is not extensive and is much less important to agriculture than many similar soils of the uplands. This soil is not subject to serious erosion. It can be farmed intensively because it is nearly level. Special attention needs to be given to control of runoff on the more sloping areas. This soil retains moisture and plant nutrients, has good tilth, and is very responsive to good management. Moderate amounts of lime and liberal applications of fertilizer are needed to maintain productivity. Growing of legume cover crops in rotation with general farm crops is beneficial.

The small part of the acreage cleared of trees produces good yields of corn, soybeans, and small grains. Improved pastures produce abundant grazing after moderate fertilization and liming.

Kalmia Series

Soils of the Kalmia series developed from materials that washed from the adjacent upland soils. They occur along streams on terraces not reached by ordinary overflow. These soils closely resemble those of the Norfolk series of the uplands. They are associated with the soils of the Myatt, Izagora, and Huckabee series.

Kalmia soils are better drained and have more yellow subsoils than the Myatt soils. They differ from the Izagora soils primarily in having coarser texture and less mottlings in the lower layers. Kalmia soils contain more materials of fine texture throughout the solum than the Huckabee soils, which have 30 to 72 inches of loamy fine sands above the materials of finer texture.

The Kalmia soils are moderately well to well drained and are moderately permeable. They are acid and contain little organic matter or plant nutrients.

Kalmia fine sandy loam, level phase (0 to 2 percent slopes) (Ka; I–1).—This soil commonly occurs in long narrow strips parallel to the nearly level stream terraces along the Perdido and Escambia Rivers. The native vegetation consists primarily of pine and a few scattered oaks and sweetgums. The undergrowth is mostly gallberry and wiregrass.

Profile description:

0 to 6 inches, dark grayish-brown fine sandy loam; friable; weak fine crumb structure; contains a small amount of organic matter.
6 to 12 inches, yellowish-brown fine sandy loam; friable; weak fine crumb structure.
12 to 36 inches, brownish-yellow fine sandy clay loam; weak medium subangular blocky structure.
36 to 42 inches, brownish-yellow fine sandy clay loam prominently mottled with a few medium-sized areas of yellowish brown and yellowish red; friable; weak medium subangular blocky structure.

The surface soil varies from dark grayish brown to brown in color and from 4 to 7 inches in thickness. The texture of the subsoil ranges from a light fine sandy clay loam to a moderately heavy fine sandy clay loam. The depth to mottles varies considerably within short distances. A few areas too small to describe separately, that have a yellowish-red subsoil, are included with this soil.

Use and management.—This soil is not extensive, but it is important on the farms where it occurs. It is suited to many crops. Because the soil is sandy, good tilth and productivity are easier to establish and maintain. It can be cultivated over a wide range of moisture conditions and not clod. It retains moisture and plant nutrients, responds to good management, and is not subject to serious erosion. Plant roots penetrate the subsoil freely.

Much of this soil has been cleared of native vegetation and is used for crops and pasture. Good yields of corn, soybeans, and small grains are common. Good management requires primarily that fertility be built up and maintained by adding lime, fertilizer, and organic matter and by using a suitable crop rotation.

Kalmia fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Kb; IIe–1).—This soil is similar to, and is most commonly associated with, Kalmia fine sandy loam, level phase. The thickness of its surface

soil is less uniform. Because of rapid runoff, it is more susceptible to erosion. A few slightly and moderately eroded areas, on slopes in excess of 5 percent, are included with this soil. Also included are a few areas too small to map separately that have a yellowish-red subsoil.

Use and management.—Much of this soil is uncleared. It is used for native range and to produce pine trees. A few acres are used for crops and pasture of the kinds grown on the level phase. Runoff and erosion need to be controlled before this soil can be used intensively. Under common management fair yields are obtained, but under improved management yields are comparable to those on the level phase.

Klej Series

Soils of the Klej series have developed from thick beds of sands and loamy sands, under the influence of a high water table. These upland soils have a dark-gray to black surface soil and yellowish-brown to brownish-yellow subsoil. They are associated with the Rutlege, Plummer, and Leon soils. The Klej soils are somewhat better drained and contain more yellow in the subsoil than the Rutlege and Plummer soils. They do not have the organic hardpan and the yellow layer above that is characteristic of Leon soils.

Klej soils are somewhat poorly drained. They are acid throughout and low in natural fertility and in organic matter. They are seldom used to produce cultivated crops.

Klej loamy sand, level phase (0 to 2 percent slopes) (Kc; IIIs–2).—This soil occurs in somewhat poorly drained, level to nearly level areas in the southwestern part of the county. It generally is in long, narrow strips that in many areas are adjacent to the Rutlege soils. The native vegetation consists principally of pine, sawpalmetto, runner oak, and wiregrass.

Profile description:

0 to 4 inches, very dark gray loamy sand; very friable; weak fine crumb structure.
4 to 12 inches, dark grayish-brown loamy sand; very friable; weak fine crumb structure.
12 to 28 inches, pale-yellow loamy sand faintly mottled with a few medium areas of olive yellow, brownish yellow, and white; very friable; weak fine crumb structure.

The surface soil varies from dark gray to black in color and from 3 to 6 inches in thickness. The subsoil layers range from brownish-yellow to yellowish-brown loamy sands and contain various amounts of yellowish-red, strong-brown, and yellow mottling. A few small areas that have materials of finer texture as depths of 30 to 42 inches are included with this soil. Also included are some areas of Klej sand that were too small to map separately.

Use and management.—Surface runoff is slow; internal drainage, slow to medium. Although this soil absorbs water readily, it stays nearly saturated during the rainy seasons, primarily because of the high water table. Though this soil is suitable for cultivation under intensive management, it is best used for pasture and forest under present conditions. If it is cleared and drained, fairly good improved pasture can be obtained. Lime must be applied. This soil loses large quantities of essential plant nutrients through leaching; therefore, complete fertilizer mixtures consisting of nitrogen, phosphate, and potash must be applied liberally, and often, after grass is established.

Most of this soil remains as cutover pineland, and the native cover furnishes poor grazing for cattle. Most of the salable timber has been cut, but some fair stands of second-growth pine are grown for pulpwood. To encourage growth of pine, management practices ought to include adequate protection from fire and the selective cutting of timber. It is desirable to restore some of this soil to forest by planting, especially in areas where there are not enough seed trees to provide stock for reseeding.

Klej loamy sand, very gently sloping phase (2 to 5 percent slopes) (Kd; IIIs–2).—This soil is almost identical with Klej loamy sand, level phase. It generally occurs on short slopes adjacent to the more nearly level Klej soils and merges with poorly drained Mixed alluvial land. This soil includes some small areas of Klej sand and a few areas with slopes in excess of 5 percent that were not large enough to be mapped separately.

Use and management.—This soil is small in acreage and is not cultivated. Runoff is much more rapid than on the level phase. Satisfactory improved pasture can be maintained under good management, including heavy applications of fertilizers and a few simple practices to control erosion. The principal use of this soil is for forest and native range. Second-growth pine grows well in areas that have had adequate protection from fire for years.

Klej sand, level phase (0 to 2 percent slopes) (Ke; IIIs–2).—This soil is distinguished from the level phase of Klej loamy sand primarily because it contains a slightly greater proportion of medium and coarse sand grains and less materials of fine texture throughout the profile. It occurs in flat or nearly level areas in the southwestern part of the county and is closely associated with the Leon and Rutlege soils.

This soil is the most extensive of the Klej soils. The native vegetation consists principally of pine, sawpalmetto, runner oak, and wiregrass.

Profile description:

0 to 4 inches, very dark gray sand; loose and single grained (structureless).
4 to 12 inches, dark grayish-brown sand; loose and single grained (structureless).
12 to 28 inches, pale-yellow sand faintly mottled with a few, medium, areas of olive yellow, brownish yellow, and white; loose and single grained (structureless).
28 to 42 inches, brownish-yellow sand with common, medium, distinct mottles of yellowish red, strong brown, and yellow; lenses of white; loose and single grained (structureless).

The surface soil varies from dark gray to very dark grayish brown in color and from 3 to 6 inches in depth. The subsoil ranges from yellowish brown to brownish yellow and contains various quantities of yellowish-red, strong-brown, and yellow mottles. In a few areas a layer of white sand occurs at a depth of about 40 inches. A few areas of Klej loamy sand and Leon sand are included with this soil because they were too small to map separately.

Use and management.—Almost all of this soil is in forest, but a small part is in pasture. It stays nearly saturated during rainy seasons because the water table

is very close to the surface. Runoff is slow; internal drainage is slow to medium.

The soil could be drained by canals and lateral ditches. Because the land is owned in many small tracts and the outlets for ditches from the individual tracts are inadequate, drainage districts would need to be organized. This soil loses large quantities of plant nutrients through leaching.

This soil produces fairly good improved pasture where it has been drained and cleared and is treated frequently with liberal amounts of lime and a complete fertilizer. Under good management 2 or 3 acres can support a cow. Pasture should not be established unless it is economically sound to provide a drainage system.

A sparse stand of pine grows on most of the soil, and the native cover furnishes poor grazing for cattle. Trees need to be planted to restore forest. Improved management, particularly protection from fire and selective cutting of trees, benefits all areas.

Klej sand, very gently sloping phase (2 to 5 percent slopes) (Kf; IIIs–2).—This soil is the least extensive of the Klej series. Except for stronger slopes it is similar to Klej sand, level phase, and occurs near it in small, irregular areas. Small areas with a loamy sand surface soil and a few areas with slopes in excess of 5 percent are included with this soil.

Use and management.—This soil is used mostly for forest and native range, but, under good management, improved pasture can be established. Because of its slightly stronger slopes, runoff is much more rapid on this soil than on the level phase. A few simple practices to control erosion are needed along the stronger slopes. Frequent applications of lime and a complete fertilizer are required because this soil is leached of large quantities of plant nutrients. Where this soil is used for forestry, adequate protection from fire and selective cutting of trees are needed.

Lakeland Series

The soils of the Lakeland series have formed from moderately thick beds of unconsolidated acid sands and loamy sands, which are on sediments of finer texture that begin at depths greater than 30 inches. These soils are associated with Norfolk and Eustis soils. They differ from the Norfolk soils in containing loose sandy materials to a depth greater than 30 inches. From the Eustis soils they differ in lacking the reddish-yellow or strong-brown color throughout the subsoil.

The Lakeland soils are somewhat excessively drained; permeability of the subsoil is very rapid. The soils are acid throughout. They are low in fertility, in content of organic matter, and in capacity to hold water. These soils generally are not used for cultivated crops in Escambia County.

Lakeland loamy fine sand, level phase (0 to 2 percent slopes) (La; IIs–1).—This soil has a grayish-brown surface soil that merges with the brownish-yellow loamy fine sand of the subsoil. It occurs on flat or nearly level ridges and is most extensive in the northern part of the county. The native vegetation consists of turkey oak and blackjack oak, a scattering of pine and dogwood, and various native grasses.

Profile description:

0 to 4 inches, dark grayish-brown loamy fine sand; very friable; weak fine crumb structure; contains small amounts of organic matter.
4 to 16 inches, yellowish-brown loamy fine sand; very friable; weak fine crumb structure.
16 to 42 inches, brownish-yellow loamy fine sand; very friable; weak fine crumb structure.

The surface soil varies from dark grayish brown to brown in color and from 2 to 5 inches in thickness. This soil is underlain by materials of finer texture below 42 inches and, in most places, within 72 inches. Areas of Lakeland loamy sand that were too small to map separately are included with this soil, as are a few small areas that have materials of finer texture beginning at depths of 30 to 42 inches.

Use and management.—This soil is low in its capacity to hold water. Water moves downward so rapidly that little is retained for plants. Leaching rapidly removes most of the plant nutrients. Yields from cultivated crops are generally low. They are considerably higher under a high level of management, which requires heavy applications of fertilizers and turning under crop residues and legumes.

This soil is used to a limited extent, but other soils of higher productivity are preferred. Many fields in the northern part of the county have small areas of this soil along their outer edges. Corn, cotton, soybeans, field peas, and sweetpotatoes grow fairly well and return fair to poor yields. Winter cover crops also grow fairly well.

Grasses for improved pasture have been planted on several hundred acres of this soil. Lime and a fertilizer mixture that contains nitrogen, phosphate, and potash are applied annually after the grass is established. Two or three acres of such pasture will support a cow.

There are some good stands of longleaf pine on this soil (fig. 5). Timber grows fairly well where adequate protection from fire has been furnished for years. Slash pine grows considerably better in fields that were abandoned after cultivation than where plantings are made

Figure 5.—Well-managed natural stand of longleaf pine on Lakeland loamy fine sand.

on the virgin soil. Most of this soil is cutover pineland, and the native cover furnishes poor grazing.

Lakeland loamy fine sand, very gently sloping phase (2 to 5 percent slopes) (lb; IIIs–1).—This soil is similar to Lakeland loamy fine sand, level phase, but external drainage is more rapid because slopes are stronger.

Use and management.—The crops grown, fertilizers needed, yields obtained, and uses of this soil are similar to those of the level phase of Lakeland loamy fine sand. But this soil requires more careful management—contour cultivation and, in some places, terracing to reduce erosion and conserve moisture.

Only a very small acreage of this soil has been cleared of native vegetation, and much of this has been abandoned. Plantings of slash pine grow well.

Lakeland loamy fine sand, gently sloping phase (5 to 8 percent slopes) (lc; IVs–1).—Except for having stronger slopes, this soil is similar to Lakeland loamy fine sand, level phase. It generally occurs on short slopes adjacent to streams and drainageways in the northern part of the county.

Use and management.—This soil is not well suited to cultivation. Yields from cultivated crops are low, and exposed areas are subject to erosion. Areas used for pasture should be carefully managed to maintain a good sod cover.

Under proper management this soil produces fairly good grazing. Without good management, the quality of the forage is poor, the yield is light, and the carrying capacity is very low. Only a small acreage of this soil has been cleared. Much of it remains in forest, the use to which it is best suited.

Lakeland loamy fine sand, sloping phase (8 to 12 percent slopes) (ld; VIe–2).—This soil is similar to Lakeland loamy fine sand, level phase, but has stronger slopes. It occurs in long, narrow areas adjacent to streams and drainageways in the northern part of the county. Included with this soil are a few areas with slopes in excess of 12 percent, and areas of Norfolk, Ruston, and Cuthbert soils that were too small to map separately.

Use and management.—Almost none of this soil is farmed. Unless an exceptionally good sod is established, care is needed to prevent erosion, even when it is used for pasture. It is best for forest.

Longleaf pines grow best on lower slopes adjacent to drainageways, where moisture is available. The best stands of pines grow where the trees are protected from fire and grazing.

Lakeland loamy sand, level phase (0 to 2 percent slopes) (le; IIs–1).—This soil differs from the Lakeland loamy fine sand, level phase, primarily because it contains a greater amount of medium and coarse sand grains throughout the profile. The largest and most typical areas occur on flat or nearly level sandy ridges in the central part of the county. The native vegetation consists of turkey oak, a few scattered longleaf pines, blackjack oaks, and various native grasses.

Profile description:

0 to 4 inches, dark grayish-brown loamy sand; very friable; contains small amounts of organic matter.
4 to 16 inches, yellowish-brown loamy sand; very friable.
16 to 42 inches, brownish-yellow loamy sand; very friable.

The surface soil varies from dark grayish brown to brown in color and from 2 to 5 inches in thickness. The second layer may be yellowish brown or brownish yellow, and the rest of the profile is brownish yellow. This soil contains materials of finer texture at depths between 42 and 72 inches.

In the northeastern part of the county, small areas of Lakeland sand are included with this soil because they were too small to map separately. Also included are a few areas that contain materials of finer texture at depths of 30 to 42 inches.

Use and management.—A small acreage of this soil is used for general crops. Because the soil is porous, there is little runoff, but water moves downward so rapidly that extreme leaching occurs. Since the capacity of this soil to hold water is low, and since it contains little plant nutrients, yields of cultivated crops are generally low. Crop yields are considerably above the average, however, if large quantities of fertilizer are applied and crop residues and legumes are turned under.

Lakeland loamy sand generally is not used for cultivated crops. But small areas occur in many fields and are used to a limited extent where more productive soils are not available. Corn, cotton, soybeans, and field peas grow fairly well and return low to moderate yields. Winter cover crops also grow fairly well. Even under careful management, however, yields are good only if the weather is favorable.

The native grasses furnish poor forage for cattle. Several hundred acres of this soil have been planted to grasses for improved pasture. Before planting, lime must be added to bring the reaction of the surface soil to pH 5.0. Frequent applications of a complete fertilizer are needed, even after the grass has been established. This soil responds well if legumes are plowed under. Two or three acres of improved pasture will support a cow.

Trees grow fairly well on this soil, and there are good stands of longleaf pine where protection from fire has been adequate for years. A considerable acreage has been planted to slash pine. In the early stages of development, slash pine consistently grows better on fields abandoned after cultivation than on virgin soil. Most of this soil remains as cutover pineland and supports scattered stands of longleaf pine, turkey oak, a few bluejack and blackjack oaks, and various grasses.

Lakeland loamy sand, very gently sloping phase (2 to 5 percent slopes) (lf; IIIs–1).—The profile of this soil is similar to that of Lakeland loamy sand, level phase. Runoff is more rapid because of the slightly stronger slopes. Some small areas affected by sheet erosion and, in some places, by gully erosion, are included with this soil.

Use and management.—Crop suitability, fertilization, yields, and uses of this soil are similar to those of the level phase, but because of the slope, this soil is not quite so easily handled. More careful management is required to reduce erosion and conserve moisture. Simple practices such as contour cultivation and growing of cover crops for green manure will control erosion and conserve moisture. Only a small acreage of this soil has been cleared for cultivation, and much of that has been abandoned. Plantings of slash pine grow well.

Lakeland loamy sand, gently sloping phase (5 to 8 percent slopes) (lg; IVs–1).—This soil has a profile similar to that of Lakeland loamy sand, level phase, but has

stronger slopes. This soil generally occurs on short slopes adjacent to streams and drainageways throughout the county. It is well drained to somewhat excessively drained and has rapid external and internal drainage. It contains little organic matter or plant nutrients. Some small areas affected by sheet erosion and, in some places, gully erosion, are included with this soil.

Use and management.—This soil is not well suited to intensive agricultural use. The rapid runoff during heavy rains causes various degrees of erosion in many areas. This soil produces fairly good grazing under good management. Without this management the quality of the forage is poor, the yield is light, and the carrying capacity is very low. Only a small acreage of this soil has been cleared; much remains in forest, the use to which most of it is best suited.

Lakeland loamy sand, sloping phase (8 to 12 percent slopes) (lh; VIe–2).—This soil has a profile similar to that of Lakeland loamy sand, level phase, but slopes are stronger. This soil is on short slopes adjacent to streams and drainageways throughout the county. The grayish-brown surface soil grades to the brownish-yellow loamy sand of the subsoil. The soil is well drained to somewhat excessively drained. It contains little organic matter or plant nutrients. The rapid runoff during heavy rains causes various degrees of erosion in areas sparsely covered with vegetation. In the northern part of the county, this soil includes areas of Norfolk, Ruston, and Cuthbert soils that were too small to map separately.

Use and management.—This soil is more suitable for forest than for crops or pasture. Almost none of it is used for farming. Longleaf pine grows more abundantly where it is protected from fire. Most of the trees—turkey oaks and a few longleaf pines—grow best on the lower slopes adjacent to drainageways, where moisture is available. These areas are only a small part of the total acreage of the soil.

Lakeland sand, level phase (0 to 2 percent slopes) (lj; IVs–2).—This soil is on flat or nearly level sand ridges, mostly in the southeastern part of the county. It differs from the level phases of Lakeland loamy fine sand and Lakeland loamy sand primarily in containing throughout its profile more medium and coarse sand and less material of fine texture. In most places the native vegetation consists of turkey oak, a few scattered longleaf pines, and various native grasses.

Profile description:

0 to 3 inches, dark grayish-brown sand; loose and single grained (structureless); contains small amount of organic matter.
3 to 10 inches, yellowish-brown sand; loose and single grained (structureless).
10 to 42 inches, brownish-yellow sand; loose and single grained (structureless).

The surface soil ranges from dark grayish brown to yellowish brown in color and from 2 to 4 inches in thickness. The second layer, a brownish-yellow or yellowish-brown sand, merges with the yellow or brownish-yellow subsoil. Areas of Eustis sand that were too small to map separately are included with this soil.

Use and management.—The poor physical qualities of this soil make it poorly suited to crops and moderately suited to pasture. It is extremely porous and loses much organic matter and other essential plant nutrients through oxidation and leaching. Loss of moisture is also excessive.

Scattered stands of longleaf pine grow fairly well to poorly where protection from fire has been adequate for years. Some of this soil is used for building sites.

Lakeland sand, very gently sloping phase (2 to 5 percent slopes) (lk; IVs–2).—Except for having stronger slopes, this soil is similar to the level phase of Lakeland sand. The largest areas are only in the southeastern part of the county. Because of slightly stronger slopes, runoff is more rapid than on the level phase. Small areas that have been affected by sheet erosion and, in some places, by gully erosion, are included with this soil.

Use and management.—This soil is poorly suited for crops and pasture. It is extremely porous and rapidly permeable, and it is readily leached of most plant nutrients. Organic matter is easily oxidized. The poor physical qualities of this soil result in poor yields.

Areas adequately protected from fire for years now have scattered stands of longleaf pine that make poor to fair growth. Some of this soil is used for building sites.

Lakeland sand, gently sloping phase (5 to 8 percent slopes) (ll; IVs–2).—This soil is similar to the level phase of Lakeland sand, but its slopes are stronger. Generally this soil occupies long, narrow areas adjacent to streams and drainageways; most of it is in the southeastern part of the county. Included with this soil are areas of Lakeland fine sand that were too small to map separately.

Use and management.—This soil is poorly suited to crops and pasture. Oxidation and leaching remove much of the organic matter and essential plant nutrients. Fertility is very low. Loss of moisture is excessive because the soil is extremely porous and rapidly permeable and has little capacity for holding water. In some places shallow gullies have formed.

Scattered stands of longleaf pine grow poorly to fairly well where adequate protection from fire has existed for years. This soil is used to a limited extent for building sites.

Lakeland sand, sloping phase (8 to 12 percent slopes) (lm; VIIs–1).—This soil is similar to the level phase of Lakeland sand but has stronger slopes. It occurs principally in the southeastern part of the county. The long, narrow areas are on short slopes adjacent to streams and drainageways. This soil is somewhat excessively drained; it has rapid external and internal drainage. Areas sparsely covered with vegetation erode during heavy rains. Shallow gullies have formed in many places.

Use and management.—This soil is not suitable for crops or improved pasture. It is low in fertility, extremely porous and droughty, and strongly sloping. It is best for forest. The trees are mainly turkey oaks and longleaf pines. The trees grow best on lower slopes adjacent to drainageways, where moisture is more available. Well-timbered areas are only a small part of the total acreage.

Lakeland, Ruston, and Norfolk Soils

In this undifferentiated group are small areas of Lakeland, Ruston, and Norfolk soils so intricately mixed that they cannot be separated on a map of the scale

used.[2] Variations in texture occur both parallel and perpendicular to the prevailing slopes. Sandy soils occur in more places than soils of finer texture. Surface runoff and erosion vary considerably according to the degree of slope and the native cover. Most areas of these soils are poorly suited to crops and pasture.

Lakeland, Ruston, and Norfolk soils, very gently sloping phases (2 to 5 percent slopes) (ln; IIIs–1).—This undifferentiated group of soils occurs most consistently in the northern and central parts of the county. The soils generally are in long, narrow strips adjacent to streams and drainageways. A few widely scattered areas are in the southern part of the county. Runoff from areas under native vegetation is medium to rapid because of the very gentle slopes. Internal drainage varies in the subsoil, and other variations in the profile are common. The native trees are mainly longleaf pine and turkey oak, but there is some red oak.

Use and management.—Under careful management, soils of this undifferentiated unit can be used for general field crops. A considerable acreage is affected by sheet erosion and, in some places, by gully erosion. Immediately after the land is cleared precautions need to be taken to reduce erosion and to conserve moisture.

Sandy areas of this unit are highly susceptible to leaching and produce little. Liberal and frequent application of a complete fertilizer is required. Though suitable for cultivation, these soils are better for improved pasture. Unless management is good, the quality of the vegetation is poor, the yield is light, and the carrying capacity of the pasture is poor.

Most of this undifferentiated unit is used for forest and native range. Second-growth pine grows especially well on the Ruston and Norfolk soils and almost as well on the Lakeland soils. Improved forest management, particularly fire control and selective cutting of trees, benefits all areas of this unit.

Lakeland, Ruston, and Norfolk soils, gently sloping phases (5 to 8 percent slopes) (lo; IVe–1).—These soils are similar to the very gently sloping Lakeland, Ruston, and Norfolk soils, but they have stronger slopes. They generally occur on short slopes adjacent to streams and drainageways in the central and northern parts of the county. Included with these soils are many areas affected by sheet erosion and, in some places, by gully erosion. These eroded areas are too small to map separately. Small areas that have lost almost all of the surface soil are common along the upper slopes.

Use and management.—Some areas are cleared of native vegetation and are used for crops and pasture, but yields are normally lower than those of the very gently sloping phases. These soils also require more exacting management, for they are lower in plant nutrients and organic matter, slightly lower in water-holding capacity, and considerably more susceptible to erosion. Contour tillage and the use of crop rotations help to conserve moisture and to curb loss of soil in areas that are used for row crops. All areas of these soils that are not cleared for agriculture greatly benefit under improved forest management, particularly fire control and the selective cutting of trees.

[2] For descriptions of the separate soils see Lakeland loamy fine sand, Ruston fine sandy loam, and Norfolk fine sandy loam.

Lakeland, Ruston, and Norfolk soils, eroded gently sloping phases (5 to 8 percent slopes) (lp; IVe–1).—This undifferentiated unit differs from the very gently sloping phases of Lakeland, Ruston, and Norfolk soils primarily because it has stronger slopes, more rapid external drainage, and somewhat more shallow soil profiles. Also, it is more susceptible to erosion. In places all of the topsoil and some of the subsoil have been removed. Most of the area is so eroded that ordinary tillage implements extend through the remaining topsoil into the subsoil. In some areas there are a few gullies approximately 125 feet apart, but they generally can be crossed with ordinary farm machinery.

Use and management.—These soils are not well suited to intensive agriculture. Only a small acreage has been cleared.

Satisfactory permanent pasture can be established only under a high level of management that will control erosion. The less severely eroded and less sloping areas can be reclaimed by terracing and other good management practices. The more sloping and more severely eroded areas are not easily reclaimed.

Most of the acreage remains in forest, the use to which these soils are probably best suited. Longleaf pine grows more abundantly where adequate protection from fire and selective cutting of timber have been practiced for years.

Lakeland, Ruston, and Norfolk soils, eroded sloping phases (8 to 12 percent slopes) (lr; VIe–2).—These soils differ from the very gently sloping phases of Lakeland, Ruston, and Norfolk soils because they are more susceptible to erosion and have somewhat thinner profiles, more rapid runoff, and stronger slopes. They occur in long, narrow strips adjacent to streams and drainageways throughout the county. The lower horizons vary greatly from place to place within short distances. They range from brownish yellow to yellowish red in color and from loamy fine sand to fine sandy clay in texture. Frequently occurring within these soils are small areas that have prominently mottled yellow, red, and gray subsoils. In some places a red iron crust crops out on the slopes or lies near the surface, and in a few places many well-rounded gravel fragments are scattered throughout the solum.

Use and management.—These soils are not suitable for intensive agricultural use. In a few of the more desirable areas, however, satisfactory improved pasture can be established under management that checks erosion. Common on the upper slopes of these soils are small areas where all of the original surface soil and parts of the subsoil have been removed by erosion. These small areas are so eroded that ordinary tillage implements extend through the remaining surface soil into the subsoil.

Most of the acreage remains in forest, the use to which it is probably best suited. Most of the trees are longleaf pine, hickory, red oak, and turkey oak. The use of improved management practices, particularly fire control and the selective cutting of trees, benefits all areas and encourages the more desirable trees to grow.

Lakeland, Ruston, and Norfolk soils, eroded strongly sloping phases (12 to 17 percent slopes) (ls; VIIe–1).—These soils differ from the very gently sloping phases of Lakeland, Ruston, and Norfolk soils in having more rapid external drainage, greater susceptibility to

erosion, somewhat more shallow soil profiles, and stronger slopes. These intricately mixed soils occur most consistently in the northern part of the county in long, narrow strips adjacent to streams and drainageways.

The surface soils are generally thin and range from dark grayish brown to grayish brown in color and from loamy fine sand to fine sandy loam in texture. Within short distances the lower horizons range from brownish yellow to yellowish red in color and from loamy fine sand to fine sandy clay in texture. Included with these soils are many small areas that have prominently mottled yellow, red, and gray subsoils. Also included are a few areas that have many well-rounded gravel fragments scattered throughout the profile and a few areas that have slopes in excess of 17 percent.

Use and management.—Mainly because of slope, these soils are not suitable for agricultural use. In places all of the surface soil and parts of the subsoil have been removed by erosion. The degree varies considerably, but most of these soils have been eroded to the extent that ordinary tillage implements extend through the remaining surface soil into the subsoil. Most of the acreage remains in cutover forest consisting of longleaf pine, red oak, hickory, and turkey oak. Improved forest management benefits these soils.

Lakewood Series

Soils of the Lakewood series developed from thick beds of loose sand materials. These soils have a light gray surface soil that contains small amounts of organic matter, which give it a salt and pepper appearance. They are associated with soils of the Leon and Lakeland series. They do not have the dark organic-matter stained pan present in the Leon soils and are better drained. Between the surface soil and the brownish-yellow sublayers, which begin at 14 to 20 inches, they have a layer of white sand that is not present in the Lakeland soils. Lakewood soils are acid throughout the profile. They are extremely low in natural fertility and contain little organic matter. These soils are excessively drained.

Lakewood sand, level phase (0 to 2 percent slopes) (lt; VIIs–2).—This light-colored upland soil occurs only in the southwestern part of the county as long, narrow strips parallel to and adjacent to the coastline. The native vegetation consists of scrub live oak, turkey oak, prickleypear cactus, a few scattered pines, and a sparse growth of grasses.

Profile description:

0 to 4 inches, light-gray sand; loose and single grained; contains small amount of organic matter.
4 to 16 inches, white sand; loose and single grained.
16 to 42 inches, brownish-yellow sand; loose and single grained.

The surface soil varies from light gray to light brownish gray in color and from 4 to 6 inches in thickness. The lower sublayers vary from brownish yellow to reddish yellow in color and in most places are within 14 to 20 inches of the surface.

Use and management.—Grazing on the sparse growth of native vegetation is the principal agricultural use of this soil. Although the soil is level or nearly level and is easily worked, it is not suitable for crops or pasture. Its productivity is very low, as well as its capacity to hold water and store plant nutrients. The excessive drainage creates a critical moisture condition throughout much of the year. As population increases, this soil rapidly becomes more important as building sites because it is so close to water and beaches.

Lakewood sand, very gently sloping phase (2 to 5 percent slopes) (lu; VIIs–2).—Except for its stronger slopes, this soil is similar to the level phase of Lakewood sand. It occurs near the coastline in the southwestern part of the county. It is associated with the Leon and Lakeland soils and the level phase of Lakewood sand.

This soil has a thin, light-gray surface soil and brownish-yellow sand in the subsoil beginning at a depth of approximately 16 inches. Some areas that have slopes in excess of 5 percent are included in this soil. Also included are a few areas that contain white sand throughout the profile but were too small to map separately.

Use and management.—This soil is of little or no agricultural value; some of it is used for building sites. The soil contains little organic matter and plant nutrients. It is rapidly permeable, has a low capacity for holding water, and tends to be droughty most of the year. Because of this, there is almost no erosion in spite of the slopes.

Leon Series

Soils of the Leon series developed from thick beds of unconsolidated sands under the influence of a high water table. These soils have a hardpan layer at depths of less than 30 inches. They are associated with the Plummer, Rutlege, and Klej soils. Leon soils are better drained than Plummer soils and have a considerably lighter colored surface soil than the Rutlege soils. They differ from the Klej soils in having an organic-matter stained pan and in lacking yellow coloring above the pan.

The Leon soils are acid throughout the profile. They are low in natural fertility and are not used to produce cultivated crops.

Leon sand (0 to 2 percent slopes) (lv; Vs–1).—This is a level to nearly level somewhat poorly drained soil. It occurs only in the southwestern part of the county. The native vegetation consists principally of pine, runner oak, saw-palmetto, and wiregrass.

Profile description:

0 to 4 inches, dark-gray to very dark gray sand; loose and single grained.
4 to 18 inches, light-gray sand; loose and single grained.
18 to 22 inches, dark reddish-brown sand; strongly cemented; massive (structureless); this is an organic-matter stained pan.
22 to 28 inches, yellow sand mottled with reddish yellow; loose and single grained.
28 to 42 inches, yellow, reddish-yellow, and very pale brown sand; mottled; loose and single grained; lighter colored as depth increases.

The organic-matter stained pan varies greatly in thickness and degree of cementation within short distances. A thin layer of light-gray, weakly cemented sandy loam commonly occurs immediately above the organic-matter stained pan. The sands vary considerably in thickness above the pan layer.

Use and management.—Almost none of this soil is cultivated, although in some places it is used for backyard gardens. Because of the high water table this soil is nearly saturated during rainy seasons. It loses considerable amounts of plant nutrients through leaching and

therefore needs frequent heavy applications of a complete fertilizer.

This soil is used mainly for forest and native range. Most of the salable timber has been cut, and the rather poor stands of second-growth pine are used for pulpwood. Satisfactory improved pasture can be maintained on this soil under good management, particularly intricate water control and heavy fertilization.

Leon sand, light colored surface phase (0 to 2 percent slopes) (lw; Vs–1).—This level to nearly level soil occurs in the southwestern part of the county in close association with Leon sand. It differs from Leon sand primarily because it has a lighter colored surface soil. The native vegetation of both these soils is similar, although on this light-colored soil it generally is not so dense. The vegetation is a scattered growth of scrub live oaks, a few turkey oaks, and a sparse stand of grasses.

Profile description:

0 to 3 inches, gray sand; loose and single grained.
3 to 26 inches, white sand; loose and single grained.
26 to 30 inches, dark-brown sand; strongly cemented; massive (structureless); this is an organic-matter stained pan.
30 to 42 inches, light yellowish-brown sand; loose and single grained.

The surface soil ranges from gray to light brownish gray in color and from 2 to 5 inches in thickness. The organic-matter stained pan ranges from a dark-brown to dark grayish-brown massive sand. Variations in the depth to the organic-matter stained pan are common; however, in most instances it occurs below 24 inches.

Use and management.—This soil is more suitable for forest than for crops and pasture. Improved forest management, particularly fire control and selective cutting of trees, benefits all areas.

Lynchburg Series

The soils of the Lynchburg series were formed from unconsolidated beds of acid sandy loam to sandy clay materials. These soils have a very dark gray to black surface soil and a light yellowish-brown to brownish-yellow subsoil. In the southern and central parts of the county they are associated with the Norfolk and Lakeland soils. Lynchburg gravelly very fine sandy loam, which occurs only in the northern part of the county, is associated with the Tifton, Irvington, and Grady soils.

The Lynchburg soils are more poorly drained than the Norfolk and Lakeland soils. They contain a higher percentage of silt and clay throughout the profile than the Lakeland soils. Lynchburg gravelly very fine sandy loam differs from the Tifton and Irvington soils primarily in being more poorly drained. It has more materials of fine texture throughout the profile than the Tifton soils, is slightly better drained, and contains less gray coloring than the Grady soils.

The soils of the Lynchburg series are somewhat poorly drained. They are acid in reaction. They contain a moderate amount of organic matter and little of plant nutrients.

Lynchburg fine sandy loam, level phase (0 to 2 percent slopes) (ly; IIIw–1).—This soil generally occurs in small areas adjacent to streams or the bases of slopes in the southern and central parts of the county. The natural vegetation consists primarily of pine, gallberry, scattered blackgum, and a thick undergrowth of wiregrass.

Profile description:

0 to 6 inches, very dark gray fine sandy loam; friable; weak fine crumb structure.
6 to 12 inches, pale-yellow fine sandy loam; friable; moderate fine crumb structure.
12 to 24 inches, light yellowish-brown fine sandy clay loam with a few, medium, faint, yellow and strong-brown mottles; friable; weak fine subangular blocky structure.
24 to 42 inches, fine sandy clay loam with brownish-yellow, yellow, strong-brown, and pale-yellow mottles; friable; weak fine subangular blocky structure.

The surface soil varies from very dark gray to dark grayish brown in color and from 5 to 7 inches in thickness. In this county the range of drainage is greater than is normal for Lynchburg soils. The dominant range in subsoil color is from brownish yellow to light yellowish brown. The depth to mottled materials varies considerably from place to place.

Use and management.—Most of this soil is in cutover forest. Only a small acreage is cleared and used for agriculture. The soil is suited to pasture and to corn, soybeans, small grains, and other field crops. Good tilth can be established and maintained because the soil is sandy. It retains moisture and plant nutrients, has little tendency to clod, and can be cultivated over a wide range of moisture content. Plant roots penetrate the subsoil freely. The soil responds well to fertilization and other good management.

Management requires mainly that fertility be built and maintained and that excess surface water be controlled. Shallow open ditches generally will dispose of the excess surface water. For maximum yields of nonlegumes, a complete fertilizer and lime are needed. Legumes need lime, phosphate, and potash.

Lynchburg fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (lz; IIIw–1).—This soil has a very dark gray surface soil. The light yellowish-brown subsoil is mottled with strong brown and yellow in the lower part. The profile is similar to that of Lynchburg fine sandy loam, level phase. This soil is closely associated with it and the Norfolk soils. A few slightly eroded areas and a few areas with slopes in excess of 5 percent are included with this soil.

Use and management.—Practically all of this soil is wooded. The crop suitability, fertility, yields, and management requirements are somewhat similar to those of the level phase of Lynchburg fine sandy loam. If the soil is to be used intensively, it needs fertilizer and simple practices to control runoff and erosion.

Lynchburg gravelly very fine sandy loam (0 to 2 percent slopes) (lx; IIIw–1).—This soil differs from the level phase of Lynchburg fine sandy loam primarily because it has a higher percentage of very fine sand, silt, and clay throughout the profile, is somewhat more poorly drained, and has numerous rounded, brown or reddish-brown iron concretions on the surface and within the profile. It commonly occurs around or adjacent to ponded areas and drainageways. The native vegetation consists mostly of a thick ground cover of various water-tolerant herbs and grasses, some scattered slash pines, and gallberry.

Profile description:

0 to 4 inches, black gravelly very fine sandy loam; friable; weak fine crumb structure.

4 to 10 inches, light yellowish-brown very fine sandy loam; friable; weak fine crumb structure.
10 to 18 inches, yellow fine sandy clay loam; firm fine subangular blocky structure.
18 to 42 inches, fine sandy clay loam with yellowish-brown, gray, strong-brown, and yellow mottles; firm subangular blocky structure.

The surface soil varies from very dark gray to black in color and from 3 to 5 inches in thickness. The subsoil is a yellow to yellowish-brown fine sandy clay loam. The depth to mottled material varies, but in most places mottling begins 16 to 20 inches from the surface. A few areas on slopes in excess of 2 percent are included with this soil.

Use and management.—The surface runoff is slow on the nearly level areas of this soil. Permeability is retarded by the subsoil of fine texture and the underlying materials. Artificial drainage is necessary to insure normal growth of crops.

In areas where drainage is feasible, this soil can be used for pasture plants and crops that tolerate wetness. If drainage is improved and adequate fertilizer and lime are applied, this soil will produce excellent pasture. Practically all of this soil is in native vegetation.

Mixed Local Alluvial Land, Moderately Well Drained

Mixed local alluvial land (Mb) is composed of colluvial-alluvial materials that have washed, rolled, or sloughed from areas of Red Bay, Ruston, Tifton, and associated soils. These materials have accumulated in moderately well drained depressions and shallow drainageways or near the base of slopes. The areas generally are long narrow strips. Level or nearly level areas are scattered throughout the northern part of the county. The native vegetation consists of a thick growth of native grasses and, in some places, pine and dogwood.

The color, texture, and structure of this land vary with the surrounding soils, the amount of material accumulated, and the kind of material on which it was deposited. In places most of the surface soil is brown to reddish-brown friable fine sandy loam; the subsoil is a light-brown to brown friable fine sandy loam. Runoff is slow to medium, and internal drainage is medium. After heavy rains, however, water may stand in low places long enough to damage crops.

Use and management.—None of this miscellaneous land type is cultivated. With proper control of surface runoff from the adjacent higher soils, it can be used for improved pasture. Selected small areas are suitable for field crops. Management requires primarily that fertility be built and maintained by applying lime and fertilizer, adding organic matter, and using a suitable crop rotation. Improved pastures of a high carrying capacity could be maintained fairly easily.

Mixed Alluvial Land, Poorly Drained

Mixed alluvial land, poorly drained (Ma) represents a mixture of dissimilar materials that border the streams throughout the county and make up a very large total acreage. This land is a result of soil material accumulation rather than soil development. The materials vary so greatly in color, texture, and consistence that any attempt to map the soils separately would be impracticable. This land is subject to frequent overflow. In many places it lies only a few inches above the water level of adjacent streams. The characteristics of this miscellaneous land type change from time to time as new material is deposited or removed with each overflow.

Texture of this land varies greatly, depending on the source of the material and the condition of the stream when the material was deposited. Locally, texture varies from silt loam to sand. The color ranges from gray to black according to the amount of organic matter in it. The land is mostly level to nearly level. Internal drainage is variable; surface runoff, very slow.

Use and management.—As a result of the wide variations in texture, and more particularly because of the hazard of flood, none of this miscellaneous land type is used for cultivated crops. Drainage is too expensive. Some of the better drained areas along the smaller drainageways are cleared and used for pasture. Most of this land type is forested with swamp hardwoods and, in some places, has an undergrowth of various kinds of water-tolerant plants.

Myatt Series

The Myatt soils occupy the lowest and most poorly drained areas on the stream terraces. They were derived from alluvium washed from the Norfolk and Ruston soils and related soils of the uplands. Most areas of the Myatt soils are associated with the Kalmia, Izagora, and Wahee soils. They are more poorly drained than these soils. In addition, they have less yellow coloring in the lower horizons than the Kalmia soils; have a more friable and coarser textured subsoil than the Izagora soils; and have a more friable, grayer subsoil than the Wahee soils.

Myatt soils are poorly drained; surface runoff is slow; internal drainage, very slow. They are strongly acid throughout.

Myatt very fine sandy loam, level phase (0 to 2 percent slopes) (Md; Vw–1).—This soil occurs principally in the northeastern part of the county. Nevertheless, small irregular patches are along the rivers and larger creeks throughout the county and in low, nearly level places near streams or slightly depressed areas at the foot of slopes that are occupied by better drained soils of the terraces. Much of the soil is forested with sweetgum, blackgum, cypress, and a few scattered pines. The more open areas are covered with water-tolerant herbs and grasses and a scattered stand of slash pine and cypress.

Profile description:

0 to 4 inches, light brownish-gray very fine sandy loam; friable; weak fine crumb structure.
4 to 14 inches, light-gray very fine sandy loam with a few fine brownish-yellow mottles; friable; weak medium crumb structure.
14 to 36 inches, light brownish-gray fine sandy clay loam with common, medium, distinct, brownish-yellow mottles; friable; moderate fine subangular blocky structure.
36 to 42 inches, light grayish-brown, brownish-yellow, reddish-yellow, and strong-brown fine sandy clay loam; mottled; friable; moderate medium subangular blocky structure.

The surface soil varies from dark gray to light brownish gray in color and from 3 to 5 inches in thickness. The subsoil is friable fine sandy clay loam that ranges

from light gray to light grayish brown and in which brownish-yellow mottles are common. From place to place the soil varies somewhat in texture, but all areas contain noticeable amounts of fine sand. Some small areas with silt loam and fine sandy loam surface soil are included with this soil.

Use and management.—The use of this soil is limited because it has very slow internal drainage and is susceptible to flooding in the rainy seasons. None of it is cultivated. In the drier months the water table is generally within a few feet of the surface. The excessive moisture in the subsoil does not favor root development of the deeper rooted plants.

Where drainage is feasible through the construction of shallow open ditches, fairly good pasture can be obtained if the land is cleared, limed, and fertilized. Drainage, however, is generally difficult to establish because the soil occurs in low positions and depressions and is very slowly permeable. This soil is used mainly as open range for cattle. The soil needs to be at least partially drained if planted slash pine is to grow satisfactorily.

Myatt very fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Me; Vw–1).—This soil occurs principally in the northeastern part of the county. Generally it is closely associated with Myatt very fine sandy loam, level phase. Frequently there is a narrow band or strip of this soil between the level phase and the adjacent soils in better drained positions. Variations within the profile are similar to those described for the level phase.

Use and management.—The use of this soil is normally limited by the very slow internal drainage and high water table or by seepage water from the higher soils. This soil is not well suited to crops that require tillage.

Fairly good pasture can be established if this soil is properly drained and fertilized. Drainage of the more sloping areas requires cautious consideration. If open ditches are used, measures need to be taken to prevent erosion.

Slash pine planted in partially drained areas of this soil grows well where protection from fire has been furnished for years.

Myatt loamy fine sand, thick surface phase (0 to 2 percent slopes) (Mc; Vw–1).—This soil differs from Myatt very fine sandy loam, level phase, primarily because it contains a slightly greater proportion of fine, medium, and coarse sand grains and less materials of fine texture throughout the profile. It occurs mostly in the southwestern part of the county along the poorly drained stream terraces and is associated with the Barth and Huckabee soils. It differs from these soils chiefly because it is less yellow and is more poorly drained. The native vegetation consists mostly of pine, waxmyrtle, and various water-tolerant herbs and grasses.

Profile description:

0 to 6 inches, dark-gray loamy fine sand; very friable; weak fine crumb structure.
6 to 18 inches, gray loamy fine sand; very friable; weak fine crumb structure.
18 to 42 inches, light-gray loamy fine sand with light-yellow and pale-brown mottles; very friable; weak fine crumb structure.

Some variations occur within the mapped areas of this soil. The surface soil varies from dark gray to very dark gray in color and from 4 to 7 inches in thickness. The subsoil, a loamy fine sand, ranges from light gray to grayish brown and has light-yellow and pale-brown mottles in the lower part. A few small areas with a fine sandy loam surface soil are included with this soil, as well as a few areas with slopes in excess of 2 percent.

Use and management.—This soil is best suited to forest and pasture. It is saturated in rainy seasons, and water stands on the surface for long periods after rains.

Although this soil is not used to produce cultivated crops, fairly good pasture can be obtained after it is cleared of native vegetation and drained. A complete fertilizer needs to be applied liberally and frequently because this soil loses large quantities of plant nutrients through leaching. Moderate amounts of lime are also needed. Under good management 2 or 3 acres can support a cow.

Plantings of slash pine grow especially well where shallow open ditches are used to dispose of excess surface water. These ditches are constructed in the same manner as fire lines but closer together and generally parallel or nearly parallel to the surrounding slope. Improved forest management, particularly fire control and the selective cutting of trees, benefit the timbered areas.

Norfolk Series

The Norfolk series consists of well-drained acid soils developed in the uplands from unconsolidated sandy loam to sandy clay materials. They are associated with the Ruston, Tifton, Lakeland, and Savannah soils. Norfolk soils differ from the Ruston soils in having a brownish-yellow rather than yellowish-red subsoil; from the Tifton soils in having less materials of fine texture in the subsoil and in being quite free of iron concretions throughout the profile; from the Lakeland soils in having a higher content of clay in the subsoil, as the Lakeland soils are notably sandy throughout their entire depth; and from the Savannah soils of the central part of the county chiefly in the absence of a tendency toward development of a pan in the lower horizons.

In the northern part of the county Norfolk soils differ from the Savannah soils primarily because their texture is not so fine. They are more friable throughout the solum, and they do not tend to develop a pan in the lower horizons.

Norfolk soils are well drained and are moderately to slowly permeable in the subsoil. Although they are low in content of organic matter and natural fertility, they respond well to good management.

Norfolk fine sandy loam, level phase (0 to 2 percent slopes) (Na; I–1).—This is one of the more extensive soils in the county. It occurs along the broad ridgetops or nearly level slopes in the northern and central parts of the county. A few small areas occur in the southern part. The native vegetation consists mainly of longleaf pine, gallberry, and wiregrass. Small red oak and dogwood trees frequently are in the undergrowth.

Profile description:

0 to 5 inches, grayish-brown fine sandy loam; friable; weak fine crumb structure.
5 to 12 inches, yellowish-brown fine sandy loam; friable; weak fine crumb structure.

12 to 18 inches, brownish-yellow fine sandy clay loam; friable; weak medium subangular blocky structure.
18 to 32 inches, brownish-yellow fine sandy clay loam; friable; moderate medium subangular blocky structure.
32 to 42 inches, brownish-yellow fine sandy clay loam with common, medium, faint mottles of reddish yellow in the lower part; friable; moderate medium subangular blocky structure.

The surface soil varies from very dark gray to grayish brown in color and from 4 to 7 inches in thickness. The subsoil, ranging from yellow to brownish yellow, is a friable fine sandy clay loam, and in most areas it has faint mottlings in the lower part. A few areas that have materials of finer texture below 30 inches are included in this soil because they were too small to map separately.

Use and management.—This soil is suited to many kinds of crops. It is so sandy that good tilth is easy to establish and maintain. It can be cultivated over a wide range of moisture content with little tendency to clod. Plant roots penetrate the subsoil freely. This soil retains moisture and plant nutrients. It responds well to fertilization and other good management practices such as liming, adding organic matter, and rotating crops.

Most of this soil has been cleared of native vegetation and is used for crops and pasture. Good yields of corn, cotton, soybeans, and small grains are common. Potatoes generally are not grown on this soil.

Pasture legumes and grasses produce abundant grazing of high quality under moderate fertilization and adequate liming. Additional lime is necessary for field crops when the reaction of the surface soil is less than pH 5.5 and for legumes when the reaction of that layer is less than pH 6.0.

Norfolk fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Nb; IIe–1).—This soil generally is closely associated with the level phase of Norfolk fine sandy loam and is similar to that soil in color, texture, structure, and consistence. A few slightly eroded areas and some small areas with materials of finer texture below a depth of 30 inches are included in this soil. Also included are a few small areas that have red mottlings in the lower subsoil.

Use and management.—Most of this soil has been cleared of native vegetation and is used for crops and pasture. Its suitability for crops and its fertilizer requirements are about the same as for the level phase. More exacting management is required, particularly along the more sloping areas where runoff needs to be controlled. Although yields are normally slightly lower than those obtained on the level phase, they are approximately equal under good management.

Norfolk fine sandy loam, gently sloping phase (5 to 8 percent slopes) (Nc; IIIe–1).—This soil has profile characteristics similar to those of Norfolk fine sandy loam, level phase. This soil differs chiefly because it occupies stronger slopes and has a slightly thinner surface soil. Most of this soil occurs as narrow strips adjacent to smoother Norfolk soils. Runoff develops quickly during heavy rains, and the degree of erosion varies greatly. Small spots that have lost much of the surface soil are common along the upper slopes. This soil includes some small areas with red mottlings in the lower subsoil and a few areas with materials of finer texture below a depth of 30 inches. Also included are some small areas with slopes in excess of 8 percent and a few areas that have been affected by sheet erosion and, in some places, by gully erosion.

Use and management.—Only a small amount of this soil is cleared for agriculture. It is lower than Norfolk fine sandy loam, level phase, in content of plant nutrients and organic matter, slightly lower in its capacity to hold water, and more susceptible to erosion. Crop yields are normally lower than on the level phase. Contour tillage and use of adequate rotations on the more sloping areas help conserve moisture and curb soil loss. Pastures of a high carrying capacity can be maintained where the most desirable grasses and legumes are adequately limed and fertilized.

Pamlico Series

The Pamlico soils formed from the remains of sedges, grasses, lilies, bay, gallberry, titi, and many other water-tolerant plants. The plant remains are fairly well decomposed and are mixed with mineral matter that makes up approximately 30 to 60 percent of the entire mass.

These soils are associated with poorly drained Mixed alluvial land and the Plummer and Myatt soils. In places the somewhat excessively drained Lakeland and Huckabee soils occur on slopes near the Pamlico soils. The Pamlico soils differ from those soils primarily in having a darker and thicker surface soil and in containing much more organic matter.

The Pamlico soils are very poorly drained; water covers the surface many months of the year. The soils are strongly to very strongly acid throughout the profile. One soil of this series was mapped in the county.

Pamlico muck (0 to 2 percent slopes) (Pa; IIIw–2).—The surface soil is a black muck of various thicknesses that rests on a black mucky sand. The small areas occur in depressions and ponded tracts along streams in the central and southern parts of the county. The native vegetation consists of bay, titi, gallberry, and a dense growth of miscellaneous water-tolerant plants.

Profile description:

0 to 30 inches, black, well-decomposed, sticky muck that shrinks and cracks when it dries.
30 to 42 inches, black mucky sand.

The surface soil is uniformly black; it varies from a few inches to many feet in thickness but averages about 30 inches. The underlying black mucky sand contains varying amounts of organic matter.

Use and management.—This soil is of minor agricultural importance. None of it produces cultivated crops. It is generally flooded in rainy seasons, and because of its slightly lower position it acts as a catch basin for seepage water. The water spreads through the soil, and a part of it eventually reaches small streams within the poorly drained Mixed alluvial land. In most places the stream level is about 1 or 2 feet beneath the surface level of the muck.

This soil should not be cultivated unless it is economically sound to provide water control and liberal applications of lime and complete fertilizer. Drainage is difficult and expensive. Some of this muck is used by nurserymen for potting plants.

Pits, Dumps, and Made Land

This miscellaneous land type (Pb) consists mostly of open excavations from which gravel has been removed, uneven areas of sand and waste materials that remain after the gravel is mined, and areas that man has filled in with several feet of materials.

Gravel pits are confined to the northeastern part of the county. In some areas, mostly in the southern part of the county, there are borrow pits, or places where soil materials were excavated for use in building airports, roads, and railroads. Many of the small ponds that form after the gravel is removed contain several feet of water throughout the year.

Sands and waste material removed from the gravel pits are sometimes returned to the excavation, but most of the time they are dumped on adjoining land. Some of the dumps are almost barren; on others the vegetation consists of a scant growth of grasses, weeds, pine, and sweetgum.

In a few places along the coast, materials that consist of sand and shells have been dredged onto formerly low-lying areas and used as building sites.

Much of this mapping unit is wasteland that furnishes poor grazing for cattle. It was not assigned to a capability unit.

Plummer Series

These soils developed under conditions of poor drainage from thick beds of acid sand and loamy sand. They are associated with the Rutlege, Leon, Klej, Portsmouth, and Lynchburg soils. The Plummer soils do not have the thick black surface soil common to Rutlege soils nor the organic-matter stained layer that is in the Leon soils. They are more poorly drained and contain less yellow coloring than the Klej soils. Plummer soils have a lighter colored surface soil and lack the finer textured subsoils that are present in Portsmouth and Lynchburg soils.

The soils of the Plummer series are poorly drained and are acid throughout the profile. They have little natural fertility and contain little organic matter. Plummer soils are not used to produce cultivated crops.

Plummer loamy sand, level phase (0 to 2 percent slopes) (Pd; Vw–1).—This soil occupies poorly drained, low-lying, nearly level areas, mostly in the central and northern parts of the county. It generally occurs in long, narrow strips near the heads of streams and drainageways and extends along these to a point where it merges with poorly drained Mixed alluvial land. The native vegetation consists of a few scattered longleaf and slash pines and an undergrowth of various water-tolerant herbs and grasses.

Profile description:

0 to 4 inches, dark-gray loamy sand; very friable; weak fine crumb structure.
4 to 24 inches, gray loamy sand mottled with strong brown and light gray; very friable; weak fine crumb structure.
24 to 42 inches, light-gray loamy sand mottled with strong brown; very friable; weak fine crumb structure.

The surface soil varies from gray to very dark gray in color and from 4 to 7 inches in thickness. The subsoil, ranging from a light gray to grayish brown in color, is a loamy sand that, in many places, contains strong-brown and brownish-yellow mottles. Variations are common. The texture of the surface soil generally ranges from loamy fine sand to loamy sand, but in places it is a light sandy loam. In some places materials of fine texture occur at shallow depths. Included with this soil are some areas of Rutlege soils that were too small to map separately, as well as some areas that are very poorly drained and permanently wet.

Use and management.—This soil is not used to produce cultivated crops. It is generally flooded during seasons of heavy rains, and seepage water from the higher soils keeps it saturated most of the year.

This soil is best suited to forest and pasture. Most of it remains under native vegetation that furnishes very poor grazing for cattle. If the soil is cleared and drained, fairly good pasture can be obtained. Lime is needed, and a complete fertilizer should be applied liberally every year after the grass is established. Under good management 2 or 3 acres of the resulting pasture can support a cow.

Some slash pine has been planted on this soil; results have been excellent where shallow open ditches were used to dispose of the excess surface water. The ditches are constructed in the same manner as fire lanes but at closer intervals and generally parallel to the surrounding slope.

Plummer loamy sand, very gently sloping phase (2 to 5 percent slopes) (Pe; Vw–1).—This soil occurs throughout the central and northern parts of the county. In most places it is adjacent to streams and drainageways. Variations within its profile are similar to those described for Plummer loamy sand, level phase. This soil includes some small areas with slopes considerably in excess of 5 percent.

Use and management.—This soil is not well suited to crops that require tillage. Management practices are somewhat more exacting than those for the level phase. Drainage and runoff, especially along the more sloping areas, require considerable attention. If open ditches are used, precautions need to be taken to prevent erosion. Slash pine planted on drained or partially drained areas of this soil grows well where fire protection has been furnished for years.

Plummer fine sand (0 to 2 percent slopes) (Pc; Vw–1).—This soil differs from the level phase of Plummer loamy sand primarily because it has more fine sand and less material of finer texture throughout the profile. It is confined to poorly drained, nearly level areas or depressions in the central and southern parts of the county. The native vegetation consists of a few scattered cypress and slash pine trees and an undergrowth of various water-tolerant herbs and grasses.

Profile description:

0 to 6 inches, dark-gray fine sand; loose and single grained.
6 to 42 inches, light brownish-gray fine sand; loose and single grained.

The surface soil varies from gray to very dark gray in color and from 4 to 7 inches in thickness. The subsurface horizons contain more brown color than those of the other Plummer soils. Some small areas with a loamy fine sand surface soil, and a few small areas with slopes in excess of 2 percent, are included with this soil. This Plummer soil is saturated during the rainy seasons, and water stands on much of the surface for long periods after rains. The water table is always high.

Use and management.—Because of its limited extent and poor drainage, Plummer fine sand is of minor agricultural importance. None of it is cultivated. Drainage ditches are required for satisfactory use. This soil is best suited to forest and pasture. Improved pasture should not be established unless drainage is economically feasible and lime and complete fertilizers can be applied liberally. This soil needs at least partial drainage if planted slash pine is to grow satisfactorily.

Plummer sand (0 to 2 percent slopes) (Pf; Vw–1).—This soil is essentially similar to Plummer loamy sand, level phase, and to Plummer fine sand. It differs primarily in having less material of fine texture and more medium and coarse sand throughout the profile. This soil is confined to poorly drained, nearly level areas in the southwestern part of the county. It is closely associated with Rutlege sand. In some places the native vegetation consists only of a ground cover of water-tolerant herbs and grasses, but in other areas a few scattered cypress trees and slash pines also grow. Some small areas support a dense growth of titi.

Profile description:

0 to 3 inches, dark-gray sand; loose and single grained.
3 to 14 inches, gray sand; loose and single grained.
14 to 42 inches, light-gray sand; loose and single grained.

The surface soil varies from gray to very dark gray in color and from 2 to 5 inches in thickness. In places the subsoil contains brownish-gray sands. Some areas of Rutlege sand are included with this soil because they were too small to map separately.

This soil is poorly drained. Water often stands on the surface for long periods during the rainy seasons, and the water table is always high. Few areas are large enough or in positions suitable for drainage. The soil is strongly acid throughout the profile and contains small amounts of organic matter.

Use and management.—This soil is of little agricultural value. Low fertility and poor drainage limit the use primarily to forest and the grazing of native vegetation. Improved pastures should be established only if it is economically sound to provide water control and to apply lime and complete fertilizers liberally. At least partial drainage is necessary if planted slash pine is to grow satisfactorily.

Portsmouth Series

The soils of the Portsmouth series are in upland areas. They formed under conditions of very poor drainage from thick beds of acid sandy clays and clays. They are associated with the Norfolk and Lynchburg soils. They differ from these soils in being poorly or very poorly drained, in having thicker and darker surface layers, and in having less yellow coloring in the lower horizons. The Portsmouth soils have almost no surface runoff. They are acid throughout their profiles. These soils are not used for cultivated crops unless drained.

Portsmouth loam (0 to 2 percent slopes) (Pg; IIIw–2).—This soil is in slight depressions that slope gradually toward the center. Small areas are scattered throughout the county. Where the soil occurs near Mixed alluvial land, poorly drained, it slopes streamward very gradually. The native vegetation consists mostly of water-tolerant herbs and grasses, but in some areas there are a few scattered gum and oak trees.

Profile description:

0 to 14 inches, black loam; friable; fine crumb structure; contains large amounts of organic matter.
14 to 20 inches, very dark grayish-brown fine sandy clay loam; firm; weak medium subangular blocky structure.
20 to 28 inches, dark grayish-brown fine sandy clay loam with brownish-yellow and gray mottles; firm; moderate medium subangular blocky structure.

The black surface soil ranges from 10 to 14 inches in thickness. The subsoil, ranging from a light gray to light grayish brown, is a firm fine sandy clay loam. The amount of mottling generally increases with depth. Texture and structure vary to some extent. Areas near Mixed alluvial land, poorly drained, generally have a somewhat coarser texture than those in the small depressions surrounded by upland soils of fine texture. Natural drainage is very poor, and water stands on much of the soil during wet seasons. Surface runoff is slow because the soil is nearly level, and the fine texture of the subsoil impedes the downward movement of water.

Use and management.—This soil cannot be cultivated without artificial drainage. Good pasture cannot be had without partial drainage. If lime and complete fertilizer are applied, pasture can be established where it is economically feasible to improve drainage.

As this soil occurs in Escambia County, it is best for forest. Though it is capable of higher uses, reclamation is seldom feasible. Growth of slash pine can be improved with simple drainage.

Portsmouth, Grady, and Bayboro Soils

Portsmouth, Grady, and Bayboro soils (0 to 2 percent slopes) (Ph; Vw–1).—These soils occur in wet, ponded areas in the northern part of the county. They vary in texture and color and are so intricately mixed that they cannot be shown separately on a map of the scale used. This undifferentiated group of soils occupies naturally wooded areas, all, or most, of which are covered with water or stay saturated throughout the year. Most of these areas occur within the Tifton-Irvington-Lynchburg soil association. Profiles of Grady and Portsmouth soils are described under the Grady and Portsmouth series. Following is a description of a Bayboro profile:

0 to 14 inches, black fine sandy loam; friable; crumb structure.
14 to 20 inches, very dark gray fine sandy clay loam; firm; massive.
20 to 30 inches, dark grayish-brown fine sandy clay with a few brownish-yellow mottlings; firm; massive.
30 to 42 inches, gray fine sandy clay with common, medium, brownish-yellow mottles; firm; massive.

Variations are common in the profile of the Bayboro soil and the other soils in this mapping unit. In places there is a shallow covering of organic matter.

Use and management.—These soils are not suitable for the crops generally grown. Although a few of the smaller areas may be drained at a somewhat low cost, it is not economically feasible to drain most of them. In extremely dry seasons, some of these soils become dry enough to provide limited pasture for cattle. Improved forest management, as described for other poorly drained areas, would prove nearly as beneficial for these soils as improvement for pasture.

Red Bay Series

The soils of the Red Bay series are among the reddest soils of the county. They developed from beds of unconsolidated sandy loam to sandy clay Coastal Plain materials. These soils are associated with the Blakely, Ruston, Faceville, and Norfolk soils. Red Bay soils differ from the Blakely soils in all horizons because they contain less reddish-brown color. They differ from the Norfolk, Ruston, and Faceville soils because they contain more red color. They are less friable throughout the lower horizons than the Norfolk and Ruston soils.

The Red Bay soils are well drained and are moderately permeable in the subsoil. They are low in content of organic matter and in natural fertility. Red Bay soils are acid throughout their profile. They are used mostly to produce field crops.

Red Bay fine sandy loam, level phase (0 to 2 percent slopes) (Ra; I–1).—This is one of the more important agricultural soils of the county. The largest areas occur in the northern part, although there are a few isolated areas in the central part. This soil occurs as nearly level areas along the smooth interstream divides. The native vegetation consists of a mixture of hardwoods and longleaf pines.

Profile description:

0 to 6 inches, dark reddish-brown fine sandy loam; friable; weak fine crumb structure.
6 to 12 inches, yellowish-red fine sandy loam; friable; weak fine crumb structure.
12 to 24 inches, red fine sandy clay loam; friable; fine subangular blocky structure.
24 to 42 inches, red fine sandy clay loam; firm; medium subangular blocky structure.

The surface soil varies from dark grayish brown to dark reddish brown in color and from 4 to 8 inches in thickness. The fine sandy clay loam subsoil ranges from red to yellowish red. Approximately one-third of the total acreage of this soil contains fine sandy loam materials to depths of 18 to 20 inches. In these areas the subsoil is a fine sandy clay loam that has the color, consistence, structure, or texture of the subsoil that occurs in the typical areas at depths between 10 and 14 inches. The acreage that has the sandy clay loam subsoil closer to the surface is more desirable for most crops. This soil is not eroded, nor is it subject to serious erosion.

Use and management.—Red Bay fine sandy loam, level phase, is one of the best general-purpose soils in the county. Practically all of it has been cleared of native vegetation and is used for field crops and pasture. Good tilth is easy to establish and maintain. This soil can be cultivated over a wide range of moisture content and has little tendency to clod. Plant roots freely penetrate the subsoil. This soil responds well to fertilization and other good management practices, such as liming, the incorporation of organic matter, and using a suitable crop rotation.

This soil retains sufficient moisture and plant nutrients for the common field crops; however, potatoes are not grown because they require more moisture. Under good management and with a favorable distribution of rainfall, excellent yields of cotton, corn, soybeans, wheat, and oats are common (fig. 6).

Figure 6.—Soybeans on Red Bay fine sandy loam.

Legumes and grasses suitable for temporary pasture produce abundant grazing of high quality if lime and moderate amounts of fertilizer are applied and if undesirable herbage is clipped. Permanent pastures are rarely established, as this soil is well suited to intensive use for most of the crops generally grown.

Red Bay fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Rb; IIe–1).—This soil has profile characteristics similar to those of the Red Bay fine sandy loam, level phase, and generally occurs in close association with it. Runoff is more rapid than on the level phase because of the slightly stronger slopes. A few areas that have been affected by sheet erosion and, in some places, by gully erosion are included with this soil.

Use and management.—Most of this soil has been cleared and is used for field crops and pasture. Its suitability for crops, need for fertilization, yields, and management requirements are somewhat similar to those described for Red Bay fine sandy loam, level phase. Susceptibility to erosion increases with slope, and the surface soil therefore averages a little thinner than that of the level phase. Because this soil is permeable and has gentle slopes, erosion can be controlled satisfactorily by contour plowing, use of crop rotations that include close-growing plants at least half the time, and similar simple practices. In some places terracing may be desirable. Under a high level of management, yields are similar to those on the level phase.

Red Bay fine sandy loam, gently sloping phase (5 to 8 percent slopes) (Rc; IIIe–1).—This soil is on gentle slopes. Its profile is similar to that of Red Bay fine sandy loam, level phase. Practically all of this soil is on short slopes adjacent to drainageways and to Red Bay soils of smoother relief. Runoff develops rapidly after heavy rains, and the degree of erosion varies widely. The surface soil is almost removed in small areas along the upper slopes, and it is very shallow in most places. On the lower slopes, however, an accumulation of soil material commonly has been deposited on the surface layer. Some small areas with slopes in excess of 8 percent are included with this soil, as well as a few that

have been affected by sheet erosion and, in some places, by gully erosion.

Use and management.—Some of this soil has been cleared and is now used for crops and pasture. Crop yields are normally considerably lower than those obtained on the level phase. Where the soil is cultivated, precautions need to be taken to reduce erosion and to conserve moisture. This soil is capable of producing excellent pasture. To maintain a high carrying capacity, adequate lime and moderate amounts of complete fertilizer need to be applied to pastures frequently.

Red Bay loamy fine sand, level thick surface phase (0 to 2 percent slopes) (Rd; IIs–1).—This soil differs from the Red Bay fine sandy loam, level phase, primarily because (1) it has fine sandy loam or fine sandy clay loam at greater depths; (2) its surface soil is a loamy fine sand instead of a fine sandy loam; and (3) it is sandier throughout the profile. Small areas of this soil occur in many fields, generally in close association with Red Bay fine sandy loams. Many small areas are between the Red Bay fine sandy loams and the Eustis soils.

The largest and most typical areas of this soil are in the northern part of the county; however, many smaller areas are in the central part. The native vegetation consists mainly of scattered longleaf pine, some scattered dogwood, and a sparse growth of bluejack oak and southern red oak.

Profile description:

0 to 4 inches, dark grayish-brown loamy fine sand; very friable; weak fine crumb structure.
4 to 14 inches, dark-brown loamy fine sand; very friable; weak fine crumb structure.
14 to 30 inches, yellowish-red fine sandy loam; friable; moderate fine crumb structure.
30 to 42 inches, red fine sandy loam; friable; moderate crumb structure.

The surface soil varies from dark brown to dark grayish brown in color and from 3 to 6 inches in thickness. The subsoil is yellowish red to red in color and, in most places, contains increasing proportions of clay at greater depths. The depth to materials of fine texture varies considerably within short distances. Some small areas of Red Bay fine sandy loam and of Eustis loamy fine sand are included with this soil because they are too small to warrant separate mapping. Also included are a few slightly eroded areas.

Use and management.—In most places erosion is negligible because of the gentle relief and the capacity of this soil to absorb moisture rapidly. However, the rapid percolation removes so much moisture and plant nutrients before the plants can use them that there is not a sufficient supply for maximum yields of crops commonly grown. Corn, cotton, soybeans, and small grains grow fairly well and generally return rather low yields.

Even where good management is practiced, the yields depend on favorable weather conditions because the supply of moisture is near the critical level for plant growth most of the year. To maintain fertility, organic matter and plant residues need to be turned under frequently. Also, lime and liberal applications of complete fertilizers are necessary.

Most of this soil is not cleared of native vegetation and remains as cutover forest that furnishes poor grazing for cattle. Satisfactory improved pastures can be established if lime and complete fertilizers are used.

Fire control, the selective cutting of trees, and use of similar improved forest management will benefit all areas of this soil that are not being used for crops and pasture.

Red Bay loamy fine sand, very gently sloping thick surface phase (2 to 5 percent slopes) (Re; IIIs–1).—The profile characteristics of this soil are similar to those of Red Bay loamy fine sand, level thick surface phase. This soil is closely associated with the level phases of Red Bay loamy fine sand and fine sandy loam. Runoff is more rapid than on the level thick surface phase of Red Bay loamy fine sand. Some very small areas of Eustis loamy fine sand and Red Bay fine sandy loam are included with this soil. A few areas of Red Bay loamy fine sand, very gently sloping thick surface phase, that are affected by sheet erosion and, in some places, by gully erosion, are included.

Use and management.—Only a small acreage of this soil is used for crops. Its low fertility and low moisture-holding capacity make intensive soil improvement necessary if the soil is to be used as cropland. Crop yields are somewhat lower than those obtained on Red Bay loamy fine sand, level thick surface phase, but in kinds of crops suited, fertilization needed, and management required, it is somewhat similar to that soil.

Precautions are required to prevent erosion where this soil is cultivated. Normally, contour cultivation is sufficient, but frequent use of cover crops or green-manure crops is needed on some of the stronger slopes.

Most of this soil remains in cutover forest. Fire control, selective cutting of trees, and similar improved forest management greatly benefit all cutover forest areas.

Red Bay loamy fine sand, gently sloping thick surface phase (5 to 8 percent slopes) (Rf; IVs–1).—This soil is similar to Red Bay loamy fine sand, level thick surface phase. It generally occurs along short slopes adjacent to drainageways and in close association with other Red Bay soils. The surface soil averages a little thinner than that of the level thick surface phase of Red Bay loamy fine sand. Surface runoff increases with slope, and the soil is moderately susceptible to erosion. Small areas that have lost almost all of the surface soil are common along the upper slopes. A large acreage has been affected by sheet erosion and, in some places, by gully erosion. Included with this soil are some areas that have slopes in excess of 8 percent. They were too small to map separately. A few small areas of Eustis loamy fine sand and Red Bay fine sandy loam are also included with this soil.

Use and management.—External drainage on this soil is generally excessive in areas that are cleared of native vegetation. Where the soil is cultivated, precautions need to be taken to reduce erosion and conserve moisture. Normally, contour cultivation is sufficient, but in many places terraces have been used. Adequate terraces are too difficult to maintain and are no longer recommended.

Because this soil has low fertility and is susceptible to leaching, complete fertilizers need to be applied frequently and liberally. This soil is not well suited to intensive agricultural use; however, under proper management it provides good grazing.

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Rough Broken Land

Rough broken land (Rg; VIIe–2) consists of steep land that is broken by many drainage channels that are sometimes dry. It occupies rough areas in the northern part of the county where external drainage is very rapid, and internal drainage is moderate. Most areas are widely scattered and range from a few to approximately 25 acres in size. Slopes range from 5 to about 60 percent but in most places are between 8 and 30 percent.

The surface soil, generally thin, ranges from dark grayish brown to grayish brown in color and from loamy fine sand to fine sandy loam in texture. The lower horizons vary within short distances. In color they range from brownish yellow to prominently mottled yellow, red, and gray, and in texture they range from loamy fine sand to fine sandy clay. In places a red iron crust crops out on the slopes or lies near the surface. Some soil materials resembling those of the Lakeland, Sunsweet, and Cuthbert soils have been recognized.

This miscellaneous land type is not extensive. It is used exclusively for forest because the surface is too rough for the use of ordinary farm machinery. Adequate measures to prevent fires are about the only requisites for re-establishing good longleaf pine where enough trees remain to afford stock for reseeding. Growing in the present forest are some slash pine, hickory, red oak, and other hardwoods, in addition to longleaf pine. Good management practices include selective cutting of timber to encourage the growth of the more desirable species.

Ruston Series

The soils of the Ruston series were formed mostly from thick beds of acid sandy loam to sandy clay materials. They are associated with the Norfolk, Red Bay, Faceville, and Eustis soils. The Ruston soils differ from the Norfolk soils primarily in being redder; from the Red Bay soils in being less red; from the Eustis soils in containing more fine-textured materials throughout the profile; and from Faceville soils in being more friable and in having a more sandy solum.

Ruston soils are well drained and have a moderately permeable subsoil. They are acid throughout the profile. The content of organic matter and natural fertility are low. The Ruston soils are well suited to most of the crops commonly grown in the area.

Ruston fine sandy loam, level phase (0 to 2 percent slopes) (Rh; I–1).—The largest acreages of this soil are in the central and northern parts of the county. The soil lies along the broad, nearly level ridgetops. The native vegetation is longleaf pine, dogwood, oak, and hickory.

Profile description:

0 to 5 inches, very dark grayish-brown fine sandy loam; friable; weak fine crumb structure.
5 to 10 inches, dark yellowish-brown fine sandy loam; friable; weak fine crumb structure.
10 to 24 inches, strong-brown heavy fine sandy loam; friable; moderate fine crumb structure.
24 to 42 inches, yellowish-red fine sandy clay loam; friable; weak fine subangular blocky structure.

The surface soil varies from grayish brown to very dark grayish brown in color and from 3 to 7 inches in thickness. The subsoil is a yellowish-red to reddish-yellow fine sandy clay loam. A few small areas that have materials of finer texture at depths of 30 inches or more were included with this soil because they were too small to map separately.

Use and management.—This soil is one of the more productive in the county. Most of it has been cleared of native vegetation and is now used for cultivated crops, small grains, and pasture. This soil is not damaged by serious erosion when ordinary care is taken. Good tilth is easy to establish and maintain. This soil retains moisture and plant nutrients. It can be cultivated over a wide range of moisture content, and plant roots penetrate the subsoil freely. Winter legumes greatly help to build and maintain the productivity of this soil. Lime is required in moderate amounts, and crops respond well to fertilizers, especially nitrogen, phosphate, potash, and to organic matter.

This soil can be farmed intensively. Good yields of corn and soybeans are common. This soil is especially good for cotton.

Pasture legumes and grasses produce abundant grazing of high quality if they are moderately fertilized and adequately limed.

Ruston fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Rk; IIe–1).—This soil is similar to Ruston fine sandy loam, level phase, in color, texture, structure, and consistence and is closely associated with it. Some small areas that contain materials of finer texture at a depth of 30 inches or more, and a few slightly eroded areas, are included with this soil.

Use and management.—A large area of this soil has been cleared of native vegetation and is used for crops and pasture. Much organic matter and liberal applications of lime and fertilizer are necessary to bring productivity to a reasonably high level. Because of slightly stronger slopes, management is somewhat more exacting than on the level phase. Special attention needs to be given to control of runoff. Although yields normally are a little lower than those obtained on the level phase, they are approximately equal under good management.

Ruston fine sandy loam, gently sloping phase (5 to 8 percent slopes) (Rm; IIIe–1).—This soil has a profile similar to that of Ruston fine sandy loam, level phase. Almost all of this soil occurs as narrow strips adjacent to the smoother Ruston soils. Runoff develops quickly during heavy rains, and the degree of erosion varies greatly. Small areas that have the surface soil almost removed are common along the upper slopes. In places, especially on the lower parts of slopes, sandy surface soil material has accumulated to a considerable depth. This soil includes some areas that have been affected by sheet erosion and, in some places, by gully erosion. Small areas that have slopes in excess of 8 percent are also included.

Use and management.—Some of this soil has been cleared of native vegetation and is used for crops and pasture. It requires more exacting management than the level phase, for it is lower in nutrients and organic matter, slightly lower in its capacity to hold water, and more susceptible to erosion. Contour tillage and use of adequate crop rotations are needed on the more sloping areas to conserve moisture and curb soil loss through erosion. Crop yields are normally lower than those obtained on the level phase.

This soil is well suited to pasture. Where the more desirable grasses and legumes are adequately limed and fertilized, a high carrying capacity can be maintained.

Ruston loamy fine sand, level thick surface phase (0 to 2 percent slopes) (Rn; IIs–1).—This soil differs from Ruston fine sandy loam, level phase, primarily because it has fine sandy loam or fine sandy clay loam at greater depths, has a loamy fine sand instead of fine sandy loam surface soil, and is more sandy throughout. It is generally closely associated with Ruston fine sandy loam and Eustis soils.

The larger areas of this soil are confined to the central and northern parts of the county. The native vegetation consists of scattered longleaf pine, dogwood, some bluejack oak and southern red oak, and various native grasses.

Profile description:

0 to 4 inches, dark grayish-brown loamy fine sand; very friable; weak fine crumb structure; contains small amounts of organic matter.
4 to 12 inches, dark yellowish-brown loamy fine sand; very friable; weak fine crumb structure.
12 to 24 inches, yellowish-brown fine sandy loam; friable; moderate fine crumb structure.
24 to 42 inches, strong-brown fine sandy loam; friable; moderate fine crumb structure.

The surface soil varies from dark grayish brown to grayish brown in color and from 3 to 7 inches in thickness. The subsoil is yellowish red to strong brown in color and generally contains more clay as depth increases.

Some small areas of Ruston fine sandy loam and Eustis loamy fine sand are included with this soil because they were too small to map separately.

Because the sandy surface soil is porous, water percolates through it rather rapidly and removes part of the soluble plant nutrients before the plants can use them. There is almost no erosion because of the gentle slope and the capacity of this soil to absorb moisture readily.

Use and management.—Small areas of this soil are in many fields. The low water-holding capacity and the content of plant nutrients are not sufficient for maximum yields of crops, although average yields are obtained under good management. Corn, cotton, soybeans, and field peas make fair growth and generally return average yields.

Large quantities of organic matter need to be turned under each year, or at least in alternate years, to maintain productivity. Liberal applications of complete fertilizers are also necessary. Where good management is practiced the yields depend mostly on favorable weather conditions, as the supply of moisture is near the critical level during much of the growing season.

To establish improved pasture, frequent applications of fertilizers are required, and lime is needed. Annual applications of nitrogen, phosphate, and potash are necessary after the grass has been established. Under good management, 2 or 3 acres of the resulting pasture can support a cow.

Ruston loamy fine sand, very gently sloping thick surface phase (2 to 5 percent slopes) (Ro; IIIs–1).—This soil is similar to the level thick surface phase of Ruston loamy fine sand and is closely associated with other Ruston soils. External drainage is more rapid than on the level phase because of the slightly stronger slopes. Some very small areas of Eustis loamy fine sand and Ruston fine sandy loam are included with this soil. Also included are a few areas that have been affected by sheet and occasional gully erosion.

Use and management.—Crop adaptation, yields, and fertilization closely parallel those of Ruston loamy fine sand, level thick surface phase. Where the soil is to be cultivated, precautions need to be taken to prevent erosion. Normally, contour cultivation is used to conserve moisture and reduce erosion. This soil responds to good management, but its low fertility and unfavorable moisture conditions make it somewhat poorly suited to cultivated crops. Most of the acreage remains as cutover forest, and the native cover furnishes poor grazing for cattle.

Ruston loamy fine sand, gently sloping thick surface phase (5 to 8 percent slopes) (Rp; IVs–1).—This soil occupies gentle slopes. The profile characteristics are similar to those of the level thick surface phase of Ruston loamy fine sand. This soil occurs on short slopes adjacent to drainageways. It is closely associated with other Ruston soils and Red Bay soils.

Much of the total area of this soil has been affected by slight sheet erosion and, in some places, by gully erosion. Small areas that have lost much of the surface soil are common along the upper slopes. This soil includes some small areas that have sandy materials throughout the profile on the lower slopes as well as a few areas that have slopes in excess of 8 percent and are too small to map separately.

Runoff from areas under native vegetation is rapid to excessive. In areas that are cleared for crop production it is generally excessive. Internal drainage is rapid, but in cleared areas less moisture penetrates to the subsoil because of the surface runoff.

Use and management.—Where the soil is cultivated, precautions need to be taken to reduce erosion and conserve moisture. Close-growing crops should occupy cultivated fields most of the time. The occasional row crops should be planted on the contour. Terraces are too difficult to maintain and are no longer recommended for this soil. Without proper management the quality of vegetation is poor, the yield is light, and the carrying capacity of pasture is very low. Because this soil has low fertility and is susceptible to leaching, it requires liberal applications of complete fertilizer. It is not well suited to intensive agricultural use. Under careful management, however, it can provide good grazing.

Rutlege Series

The Rutlege soils formed under poor drainage from thick beds of acid sandy materials. They are associated with the Plummer, Portsmouth, Leon, and Klej soils. They differ from Plummer soils because they have a thick black surface soil, and from the Portsmouth soil because they lack a layer of fine-textured materials within a depth of 30 inches. Rutlege soils are more poorly drained and have a darker and thicker surface layer than the Leon and Klej soils.

The Rutlege surface soil contains much organic matter. The soils are poorly and very poorly drained, primarily because of a high water table. They are acid in reaction

throughout the profile. One soil of this series was mapped in the county; it is not used for cultivated crops.

Rutlege sand (0 to 2 percent slopes) (Rs; IIIw–2).—The dominantly large, irregular bodies of this soil are mostly in poorly drained and very poorly drained, nearly level areas in the southwestern part of the county. The soil commonly occurs adjacent to Fresh water swamp, and generally between this miscellaneous land type and better drained soils. It frequently occurs in depressions and has a very gradual slope toward the center of the depression.

In places the native vegetation consists only of a ground cover of herbs and grasses that grow in water or water-saturated soil, but in other areas a few scattered cypress, slash pine, and gallberry also grow. Many small areas that have a dense growth of titi are scattered over this soil.

Profile description:

0 to 12 inches, black sand; very friable; weak fine crumb structure.
12 to 32 inches, dark-gray sand; very friable; weak fine crumb structure.
32 to 42 inches, light brownish-gray sand; loose and single grained.

The surface soil is black and varies from 10 to 14 inches in thickness. The subsurface horizons range from gray to very dark gray and in many places contain more brown color than the typical Rutlege soils. This soil includes some areas of Plummer sand that were too small to map separately.

Unless it is drained, Rutlege sand is not well suited to crops that require tillage. The water table is continuously high, and it is generally normal for water to stand on the surface for long periods during rainy seasons. It is economically unsound to provide water control in most of the depressional areas because of the difficulties and expense involved. This soil is best suited to forest and pasture.

Use and management.—Where it is economically sound to provide water control, this soil is suitable for a limited variety of crops, but is fairly good for pasture. Lime must be applied, and liberal amounts of a complete fertilizer are needed annually after the grass is established. Under good management 2 or 3 acres of the resulting pasture will support a cow.

Slash pine is planted in a few areas. For its satisfactory growth, this soil requires at least partial drainage. Growth is excellent where a sufficient number of shallow open ditches are used to dispose of the excess surface water. Poor drainage limits the use of this soil mostly to forest and grazing of native vegetation.

Savannah Series

The Savannah soils formed from thick beds of unconsolidated sandy clay loams and sandy clays. They are associated with the Tifton, Faceville, Carnegie, and Norfolk soils. Savannah soils differ from them in tending toward a pan development in the lower subsoil. They do not have the numerous reddish-brown iron concretions that are in the Tifton soils, and from the Faceville soils they differ in lacking the yellowish-red to red lower horizons.

The Savannah soils in the northern part of the county differ from the Norfolk soils mainly in having a finer texture and in being less friable throughout the solum; whereas, in the central part they differ from the Norfolk soils mainly on the basis of their tendency to develop a pan. Savannah soils are moderately well drained and moderately to slowly permeable in the subsoil. They are acid throughout.

Savannah fine sandy loam, level thick solum phase (0 to 2 percent slopes) (Sa; IIw–1).—The most typical areas of this soil are confined to the northern part of the county, where they occupy parts of the smooth interstream divides. This soil was originally forested with a heavy growth of longleaf pine. Except in a few very small areas, the timber has been removed.

Profile description:

0 to 5 inches, dark grayish-brown fine sandy loam; friable; weak fine crumb structure.
5 to 10 inches, yellowish-brown fine sandy loam; friable; weak fine crumb structure.
10 to 24 inches, brownish-yellow fine sandy clay loam; firm; fine subangular blocky structure.
24 to 36 inches, brownish-yellow fine sandy clay loam weakly mottled with brown, pale yellow, and red; firm; moderate subangular blocky structure.
36 to 42 inches, fine sandy loam with brownish-yellow, strong-brown, pale-yellow, and red mottles; firm; massive and tending toward development of a pan.

The surface soil varies from very dark grayish brown to grayish brown in color and from 3 to 7 inches in thickness. The subsoil is a yellow to a brownish-yellow fine sandy clay loam. The depth to mottled materials varies considerably within short distances. In many places the tendency toward pan formation is not apparent within a depth of 42 inches. In most places it is difficult to recognize the tendency toward a pan if a soil auger is used in taking samples.

Use and management.—In the northern part of the county this soil has good physical properties, good workability, and a good capacity for absorbing moisture. Control of erosion is not a difficult problem. The soil responds well to good management and is well suited to intensive use. Moderate amounts of lime and liberal applications of complete fertilizer are required to maintain high productivity.

Most of this soil has been cleared of native vegetation and is in constant use for field crops. Corn, cotton, soybeans, small grains, and potatoes produce good yields.

Since this is one of the better soils for general field crops, it is not often used for pasture. Where fertility is kept at a fairly high level, excellent pasture of high quality can be produced. Where legumes are grown lime needs to be added when the reaction of the surface soil falls below pH 6.0.

Savannah fine sandy loam, very gently sloping thick solum phase (2 to 5 percent slopes) (Sb; IIe–3).—This soil differs from Savannah fine sandy loam, level thick solum phase, because it has a somewhat sandier solum, has a lower capacity for holding water, and erodes more easily. Various amounts of iron concretions are present. The largest and most typical areas of this soil are confined to the central part of the county.

This soil contains areas of less than one-quarter acre up to several acres in size that have lost various amounts of the surface soil through sheet erosion. These eroded areas produce less and do not have so good a moisture supply or so much organic matter as the uneroded areas.

Use and management.—Conservation practices are more difficult on this soil than on the level thick solum phase of Savannah fine sandy loam. But the soil responds to good management, and it is similar to the level phase in productivity, land use, fertilizer requirements, and suitability for crops. The use of this soil and the yields produced depend much on the care it receives. Only a small percentage of the total acreage is cultivated; most of it remains as cutover forest.

Stough Series

The soils of the Stough series developed from materials that were washed from acid upland soils by the streams when they flowed at higher levels. These soils are associated with the Barth, Kalmia, and Myatt soils.

The Stough soils differ from the Barth soils primarily because they contain more soil materials of fine texture throughout the profile. From the Kalmia soils they differ in being somewhat more poorly drained, and from the Myatt soils they differ in being better drained and more yellow throughout the profile.

Surface runoff on Stough soils is slow; internal drainage is slow to medium. These soils are acid throughout their profile. Although the content of organic matter and natural fertility are low, these soils are suited to many of the crops commonly grown in the area.

Stough fine sandy loam (0 to 2 percent slopes) (Sc; IIIw–1).—The most typical areas of this soil are confined to narrow strips along the Perdido River in the southwestern part of the county and along the Escambia River in the northeast. The soil occurs on nearly level terraces that are somewhat poorly drained. The native cover is a mixture of pine, sweetgum, and several kinds of oak.

Profile description:

0 to 6 inches, dark-gray fine sandy loam; friable; weak fine crumb structure.
6 to 12 inches, grayish-brown fine sandy loam; friable; weak fine crumb structure.
12 to 24 inches, light yellowish-brown fine sandy clay loam faintly mottled with yellow in the lower part; friable; weak fine subangular blocky structure.
24 to 42 inches, brownish-yellow fine sandy clay loam mottled with yellow, strong brown, and light gray; friable; weak fine subangular blocky structure.

The surface soil varies from very dark gray to dark grayish brown in color and from 5 to 7 inches in thickness. The subsoil is light yellowish-brown to brownish-yellow, friable fine sandy clay loam. A few areas that have a loamy fine sand surface soil are included with this soil, as are a few very gently to gently sloping areas with slopes in excess of 2 percent.

Use and management.—This soil is of only local agricultural importance. Drainage ditches are necessary if it is to be used successfully for row crops or pasture. Corn, soybeans, small grains, and similar crops produce fair yields if moderate quantities of lime and liberal amounts of complete fertilizers are applied. Good yields are common in seasons that have a favorable distribution of rainfall.

Fairly good improved pasture can be maintained on this soil by applying a complete fertilizer frequently and supplying enough lime to keep the soil reaction within the best range for plant growth. Under good management 2 or 3 acres of this pasture can support a cow.

Most of this soil is used for forest products and woodland pasture. Where the soil is used exclusively for forest, management needs to include fire control and the selective cutting of timber.

Sunsweet, Carnegie, and Cuthbert Soils

In parts of this county small areas of Sunsweet, Carnegie, and Cuthbert soils are so intricately mixed that they cannot be shown separately on a map of the scale used. The largest and most typical areas are in the northern part of the county. To a lesser extent, there are areas in the central part, but in the southern part there are none.

The small bodies of soils are mixed, both across and up and down the slopes. Surface runoff and erosion vary considerably with the degree of slope and the plant cover. Most of the areas are poorly suited to crops or pasture.

Sunsweet, Carnegie, and Cuthbert soils, very gently sloping phases (2 to 5 percent slopes) (Sd; VIe–1).—These soils occur most consistently in the northern part of the county, although a few widely scattered areas are in the central part. In most areas they are in long, narrow strips adjacent to streams and drainageways. Runoff is rapid, and internal drainage is medium to slow. The vegetation is primarily longleaf pine, with a few scattered red oaks and dogwoods.

A profile of Carnegie fine sandy loam is described on page 10. Profiles of the other two soils are described as follows:

Sunsweet soil:

0 to 6 inches, dark grayish-brown fine sandy loam; friable; weak crumb structure.
6 to 12 inches, brownish-yellow fine sandy clay loam; friable; weak medium subangular blocky structure.
12 to 20 inches, brownish-yellow fine sandy clay loam with few pale-yellow, yellowish-brown, and red mottles; firm; moderate medium subangular blocky structure.
20 to 42 inches, fine sandy clay mottled with pale yellow, strong brown, red, and light gray; firm; massive (structureless).

Small, rounded, brown or reddish-brown iron concretions occur on and throughout the surface soil. In places an iron crust of varying thicknesses lies at or near the surface. The thickness of the surface soil varies widely according to slope and degree of erosion.

Cuthbert soil:

0 to 4 inches, dark grayish-brown fine sandy loam; friable; weak fine crumb structure; some iron concretions.
4 to 16 inches, yellowish-brown fine sandy loam; friable; moderate medium crumb structure; iron concretions may or may not be present.
16 to 42 inches, reddish-yellow fine sandy clay; common, medium, red and gray mottles present; firm; massive (structureless).

According to differences in slope and erosion, the surface soil varies from very dark grayish brown to grayish brown in color, and also varies in thickness. In places iron concretions occur within the upper horizons. The depth to mottling varies, and the mottles themselves vary in abundance, size, and contrast.

Use and management.—Most areas of these soils are used for forestry and native range. Second-growth pine does very well. Fire control, selective cutting of trees, and similar good management would benefit the forested areas.

Few areas can be used safely for field crops, but most areas will produce satisfactory improved pasture. Management is complicated, however, by the fact that the soils vary so much within short distances. As soon as the soils are cleared, steps should be taken to control erosion and conserve moisture. Good management will include use of lime and fertilizer to establish a good sod cover.

Sunsweet, Carnegie, and Cuthbert soils, gently sloping phases (5 to 8 percent slopes) (Se; VIe–1).—These soils normally are on short slopes adjacent to streams and drainageways in the central and northern parts of the county. Most of the acreage has been affected by varying amounts of sheet erosion and occasional gully erosion. Some small areas are so eroded that ordinary tillage will reach into the subsoil. In other places all of the surface soil and part of the subsoil have been removed.

Use and management.—Only a small part of the total acreage has been cleared, as these soils are not well suited to cultivation. They need more exacting management than Sunsweet, Carnegie, and Cuthbert soils, very gently sloping phases, and crop yields are slightly to considerably lower. Forest management suggested for the very gently sloping phases would be beneficial on these soils.

Sunsweet, Carnegie, and Cuthbert soils, eroded sloping phases (8 to 12 percent slopes) (Sf; VIIe–1).—The largest and most typical areas of these soils are adjacent to streams and drainageways in the northern part of the county. Smaller areas are in the north-central part. Most of the areas are eroded to the extent that ordinary tillage will reach into the subsoil. In places, particularly on the upper slopes, all of the surface soil and part of the subsoil have been removed by erosion. The profiles of these soils are variable, and in places a red iron crust crops out on the slopes or lies near the surface. These soils are more extensive than the other phases of Sunsweet, Carnegie, and Cuthbert soils.

Use and management.—These soils are not well suited to agriculture, but satisfactory improved pastures can be established on the more desirable areas if a high level of management is practiced. The strong slopes and slowly permeable subsoil will cause serious erosion if the soils are not protected by vegetation.

Most of the acreage is in forest and is probably best suited to that use. The growth consists mostly of longleaf pine and red oak. The forest management practices suggested for other phases of Sunsweet, Carnegie, and Cuthbert soils are suitable for these soils.

Sunsweet, Carnegie, and Cuthbert soils, severely eroded sloping phases (8 to 12 percent slopes) (Sg; VIIe–1).—These intricately mixed soils occur in long, narrow strips adjacent to streams and drainageways, mainly in the northern part of the county. The amount of erosion varies, but in most areas practically all, or all, of the original surface soil has been removed, and in some places part of the subsoil is gone. Included are a few areas that are less eroded than the rest.

Use and management.—Mainly because of strong slopes and erosion, these soils are not suited to agriculture. Most of the acreage is in cutover forest consisting of longleaf pine, red oak, hickory, and dogwood. The forest management suggested for other phases of Sunsweet, Carnegie, and Cuthbert soils, particularly control of fire and selective cutting, will encourage growth of more desirable trees in these soils.

Tidal Marsh

Tidal marsh (Ta; VIII–1) consists of areas along the coast that are often covered by salt water or brackish water at high tide. It lies adjacent to bays and lagoons in the southwestern part of the county. These flat or nearly level areas are associated with Coastal dune land and beach; they are only a few feet above sea level. Included with this land are a few tidal flats that are almost barren because they are so salty.

Use and management.—This land has little agricultural value. It is used mainly for wildlife. It is treeless but has a dense covering of salt-tolerant rushes, herbs, and grasses that have accumulated various amounts of partly broken up and decayed organic matter. Many burrows of fiddler crabs are in these salt flats and along the edges of the dense vegetation.

Tifton Series

Soils of the Tifton series developed from beds of unconsolidated sandy clay loams and sandy clays. An outstanding feature of these upland soils is the presence of many small, brown or gray, rounded iron concretions on the surface and throughout the profile. Tifton soils are associated with Carnegie, Norfolk, and Irvington soils and Lynchburg gravelly very fine sandy loam.

Tifton soils differ from the Carnegie soils in ranging from yellow to brownish yellow, rather than yellowish red to red, in the subsoil. From the Norfolk soils they differ because they have many concretions, are browner in color, and contain more materials of fine texture throughout the profile. They differ from Irvington soils in being better drained and in containing mottled horizons at greater depths. From Lynchburg gravelly very fine sandy loam they differ in occupying a higher topographic position, in being better drained, in containing fewer mottles at greater depths, and in having a fine sandy loam, instead of a very fine sandy loam, surface soil.

Tifton soils are well drained and are moderately permeable in the subsoil. They have a low supply of organic matter, and all horizons of the profile are acid. Tifton soils are well suited to the crops generally grown in the area.

Tifton fine sandy loam, level phase (0 to 2 percent slopes) (Tb; I–2).—This soil occurs along broad ridgetops and is confined to the central and northern parts of the county. It is one of the most extensive soils in the county. The native vegetation consists mainly of pines and a few scattered oaks and hickory.

Profile description:

0 to 4 inches, dark-gray fine sandy loam; friable; granular structure.
4 to 10 inches, brownish-yellow heavy fine sandy loam; friable; fine crumb structure; iron concretions.
10 to 36 inches, brownish-yellow fine sandy clay loam to fine sandy clay; friable to firm; medium subangular blocky structure; iron concretions.
36 to 42 inches, brownish-yellow fine sandy clay mottled with strong brown and reddish yellow; friable to firm; medium subangular blocky structure.

The surface soil varies from dark gray to very dark grayish brown in color and from 4 to 7 inches in thickness. Mottlings in the subsoil, generally at depths of 30 inches or more, vary considerably as to abundance, size, and contrast. In places the surface is nearly covered with small, rounded, iron concretions, and in others they are nearly absent. In most places, however, the quantity ranges from 10 to 25 percent of the soil mass and the greatest amount is at depths between 6 and 18 inches. This soil is not susceptible to erosion, primarily because of its gentle slope. It is well drained and has moderate internal drainage.

In the northwestern part of the county, some small areas of Irvington soils are included with this soil.

Use and management.—This is one of the best agricultural soils in the county, and much of it is under cultivation (fig. 7). Plant roots penetrate the subsoil freely, and the soil retains enough moisture to insure at least part of a crop during the more severe droughts. This soil can be cultivated over a wide range of moisture content. Because it contains so much sand, good tilth is easy to establish and maintain.

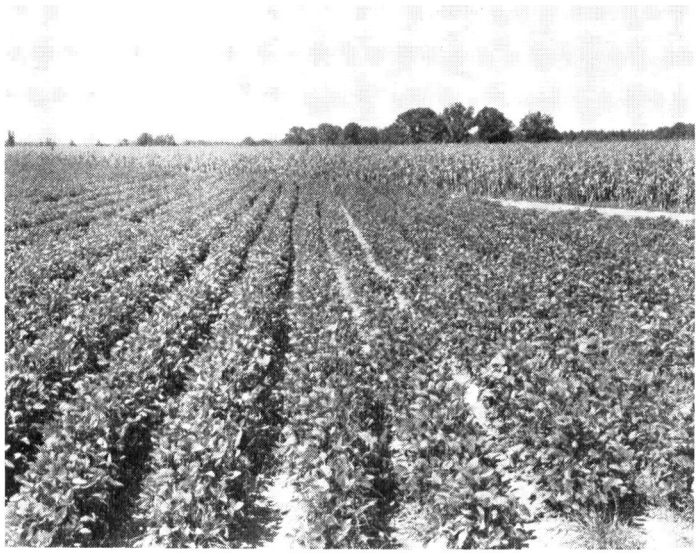

***Figure 7.*—Soybeans and corn on Tifton fine sandy loam. Trees in background are on Red Bay fine sandy loam. Soils of both series are desirable for soybeans and corn; excellent yields are obtained.**

This soil can be used intensively. It is well suited to a wide range of crops and pasture. Potatoes, soybeans, corn, small grains, and, to a lesser extent, cotton will grow well and return high yields. Where potatoes are grown the soil reaction needs to be kept at a somewhat lower pH than for other crops, to control potato scab. Management requirements of this soil are not very exacting. Primarily they are additions of lime in moderate amounts, fertilization, incorporation of organic matter, and use of a suitable crop rotation.

Tifton fine sandy loam, very gently sloping phase (2 to 5 percent slopes) (Tc; IIe–2).—In profile characteristics and in most other respects this soil is similar to the Tifton fine sandy loam, level phase. It generally is closely associated with other Tifton soils. A few slightly eroded areas and some small areas that have a reddish-yellow subsoil are included.

Use and management.—Some of this soil has been cleared of native vegetation and is being used for crops. Suitability for crops, fertilization, and, under proper management, yields closely parallel those of Tifton fine sandy loam, level phase. To keep productivity at a reasonably high level, cover crops need to be grown. They help to increase the content of organic matter and to improve the moisture-holding capacity. Because of the dominantly gentle slopes, this soil is only moderately susceptible to severe erosion; however, intensively used areas that have stronger slopes need some simple practices to control runoff and erosion. The management needs of this soil are primarily liming, fertilization, incorporation of organic matter, use of a suitable crop rotation, and control of surface runoff.

Tifton fine sandy loam, gently sloping phase (5 to 8 percent slopes) (Td; IIIe–2).—This soil is similar to Tifton fine sandy loam, level phase. Almost all of it occurs as an outer border, or narrow band, around areas of the level phase or on slightly stronger slopes adjacent to drainageways. The color of the subsoil varies somewhat and in places may range from brownish yellow to yellowish red. Much of this soil has been affected by sheet erosion and, in some places, by gully erosion.

Use and management.—Most of this soil remains in cutover forest, and the native vegetation furnishes poor grazing for cattle. If this soil is cultivated, it requires careful management that will conserve and maintain its productivity. Erosion needs to be checked. Normally, contour cultivation is used; however, in many places terraces are needed. Crop yields in most places are somewhat lower than those obtained on Tifton fine sandy loam, level phase. Although this soil is a little more difficult to work and conserve than the level phase, it responds well to applications of lime and fertilizer. Legume crops can be grown to add the required organic matter.

Where fertility is kept high, pastures of high quality can be produced (fig. 8). The more desirable grasses and legumes grow well under good management, and a pasture of high carrying capacity is not extremely difficult to maintain.

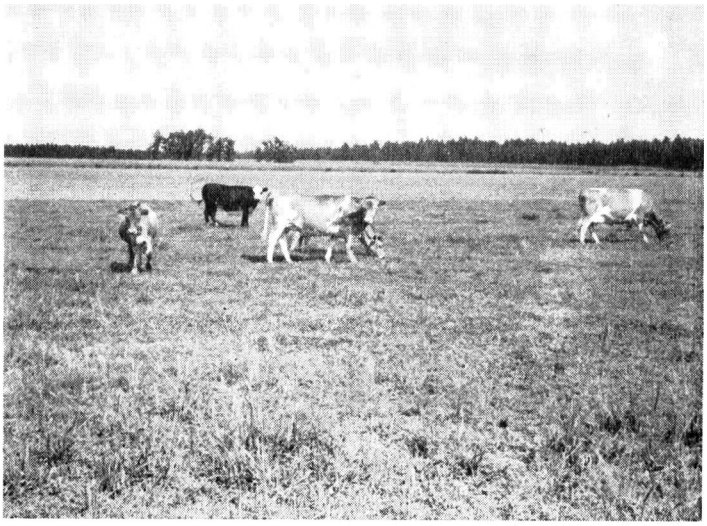

***Figure 8.*—Dairy cattle grazing improved grass-legume pasture on Tifton fine sandy loam.**

Wahee Series

Soils of the Wahee series developed from materials that washed from acid upland soils. These materials were brought down and deposited by streams when they flowed at higher levels. The Wahee soils are associated with the Izagora, Kalmia, and Myatt soils. They differ from the Izagora and Kalmia soils in being less well drained. They have finer textured subsurface layers than the Izagora, Kalmia, and Myatt soils. The Wahee soils are somewhat poorly drained, or slightly better drained than the soils of the Myatt series. Wahee soils have slow surface runoff, very slow internal drainage, and a very strongly acid reaction throughout the profile. One soil of the Wahee series was mapped in the county.

Wahee very fine sandy loam (0 to 2 percent slopes) (Wa; Vw–1).—This soil is in small areas or strips along the Escambia River in the northeastern part of the county. It is in level to nearly level, somewhat poorly drained areas that slope very gently streamward. The native vegetation consists of pine, sweetgum, and several kinds of oak.

Profile description:

0 to 5 inches, dark grayish-brown very fine sandy loam; friable; weak medium crumb structure.
5 to 16 inches, light olive-brown fine sandy clay loam with common, medium, faint mottles of yellow; friable; weak medium subangular blocky structure.
16 to 22 inches, light yellowish-brown silty clay loam with common, medium, distinct mottles of brownish yellow and a few fine prominent mottles of yellowish red; firm; moderate medium subangular blocky structure.
22 to 42 inches, clay mottled with light brownish gray, brownish yellow, and red; very firm; strong medium subangular blocky structure.

The surface soil varies from dark grayish brown to very dark grayish brown in color and from 4 to 6 inches in thickness. The subsoil is a firm silty clay loam to clay that is prominently mottled with red, yellow, and gray. A few small, slightly better drained areas that have a yellowish-red and red subsoil and show some variation in texture and structure are included with this soil. Included also are a few areas that have very gentle slopes in excess of 2 percent.

Some of this soil is overflowed when streams are at high flood stage. Drainage is rather poor because the surface is nearly level and the subsoil is fine textured. Since the compact subsoil does not allow water to percolate readily, this soil may erode under cultivation, although the slope is mainly less than 2 percent. The soil does not allow easy penetration of roots.

Use and management.—There is little of Wahee very fine sandy loam in the county. It is almost all in undeveloped woodland. None is cultivated. Adequate water control for cultivated crops is difficult and generally not feasible. This soil is suitable for improved pasture if simple surface drainage is provided.

Soil Associations

A soil association consists of an area in which the soils form a characteristic geographic pattern. It may contain many soils or only a few. The soils may be similar or very different. The soils in an association may or may not be similar in their suitability for agriculture.

The soils of Escambia County can be generalized in 12 soil associations, which are shown on the colored map at the back of this report. Each association has a descriptive name, as shown in the legend for the map. A part of this descriptive name is the name of those soil series dominant in the association. The name of the series most extensive in the association is given first. Thus, in association 2 (Tifton–Irvington–Lynchburg), the Tifton soil is listed first because it is the most extensive. In any association there may be minor areas of soils belonging to series not listed in the name of the association.

Soil association maps are used for different purposes than detailed soil maps. They are useful to those who are interested in the ability of large areas to support a prosperous agriculture, or to people interested in the main problems that confront the farmers on most of the farms in a given area. Soil association maps are also useful in regional studies of agricultural production, forestry, water storage, flood reduction, and highways, electric services, and other public facilities.

In the following pages the 12 soil associations are discussed in the order they are shown on the map legend. The associations have been separated into three major groups according to topographic positions. Nearly level to gently sloping soils on uplands; sloping to steep soils on uplands; and nearly level soils of river terraces, depressions, and lowlands.

Nearly Level to Gently Sloping Soils on Uplands

The nearly level to gently sloping soils on the uplands in this county make up associations 1, 2, 3, 4, 5, and 9. The locations of the various areas of these soil associations are shown on the colored map at the back of this report.

Dark reddish-brown loams and sandy loams; red subsoils; well drained: Red Bay-Blakely (1)

This association occurs in level to gently undulating areas, mostly in the northern part of the county. The soils are well drained. Internal drainage is medium. The Blakely soils occur as scattered pockets within much larger areas of Red Bay soils. The Red Bay soils occupy more than 75 times the acreage occupied by the Blakely soils.

Many of the better farms are on this soil association. Nearly all of the acreage has been cleared and is used for general farming. Tilled crops, small grains, and legumes are the main crops. The soils are low in natural fertility, but they can be built up to, and maintained at, a good level of productivity. The soils of this association present only a few simple problems of management. They are well suited to intensive agricultural use.

Dark-gray sandy loams; mottled subsoils; well drained to somewhat poorly drained: Tifton-Irvington-Lynchburg (2)

This soil association lies in a broad strip extending north from Walnut Hill to the State line and southward on both sides of Boggy Creek as far as McKinnonville.

The land is dominantly smooth, though there are some very gentle slopes. The Tifton soils predominate; their aggregate area is almost twice that of the Irvington and Lynchburg soils. Surface runoff is slow because of the nearly level relief. The underlying slowly permeable sandy clay materials cause slow internal drainage, and there is little lateral movement of water.

The Tifton soils of this association tend to have darker surface soil and to be slightly less well drained than the more sloping Tifton soils in other parts of the county. The Lynchburg soils are somewhat poorly drained. The Irvington soils are intermediate in drainage between the Lynchburg and Tifton soils of the area.

Throughout the year the soils of this association have a moisture supply favorable for crops, but it is necessary to remove excess surface water. The physical properties of these soils were once considered too unfavorable to permit intensive agriculture. Recently, however, large acreages have been cleared and, with the use of mechanized equipment and a system of drainage, they have proved to be among the better soils of the county for pasture and for production of potatoes, soybeans, and corn.

Grayish-brown sandy loams; yellowish subsoils; well drained or moderately well drained: Norfolk-Ruston-Savannah (3)

The Norfolk–Ruston–Savannah soil association occurs mainly on level to gently sloping smooth stream divides. The Norfolk soils occupy almost twice as much of the association as the Ruston and Savannah.

The Norfolk soils are well drained, the Ruston are slightly better drained than the Norfolk, and the Savannah are moderately well drained to imperfectly drained. The Norfolk and Ruston soils are much alike in structure but differ slightly in color. The Savannah soil has a fragipan, or weakly cemented layer, in the subsoil that does not appear in the Ruston and Norfolk.

Rather large areas have not been cleared for agriculture. The association is well suited to most crops planted in this county, but it is low in organic matter and plant nutrients. If management is applied to improve and to maintain productivity, it will produce good yields of most crops. The steeper parts of the association are very susceptible to erosion, but they can be used for limited cultivation, for pasture, or for forestry.

Dark-gray sandy loams; slightly compact subsoils; well drained: Tifton-Carnegie-Faceville (4)

This soil association occurs north of alternate United States Highway 90 and in scattered areas throughout the county to the Alabama State line. These soils generally are level to gently sloping. The Tifton soils predominate; their aggregate is about twice that of the Carnegie soils and almost ten times that of the Faceville soils.

Tifton soils differ from Carnegie and Faceville soils chiefly in having a yellow to brownish-yellow subsoil rather than a yellowish-red to red subsoil. Carnegie soils have more iron concretions, both on the surface and throughout the profile, than do the Faceville soils.

The soils of this association are well drained. Internal drainage is moderate. They are moderately fertile and can be built up to, and maintained at, a good level of productivity.

Much of the level to very gently sloping acreage in this association has been cleared and is used for general farming. Almost all of it is sufficiently fertile to be used for pasture or forest. The Carnegie soils are very susceptible to erosion, especially in areas that are too steep to permit tillage. A large acreage of nearly level land is in forest; it is good as potential agricultural land.

Gray sands; very sandy subsoils; somewhat excessively drained: Lakeland-Eustis (5)

The Lakeland–Eustis soil association occurs in rather large areas throughout the county. The soils are mostly level or gently sloping, although irregular strips of steeper soils occur along the major drains. The soils of this association are somewhat excessively drained. External and internal drainage are rapid. The aggregate area of Lakeland soils is almost twice that of Eustis.

The Lakeland soils differ from Eustis chiefly in having yellow to pale-brown subsoil instead of reddish-yellow to reddish-brown subsoil. In most places the soils of this association are sandy to depths greater than 42 inches, but there are a few areas of Lakeland soil with a sandy clay layer at depths between 30 and 42 inches.

The soils of this association are very droughty. They contain small amounts of organic matter and have low fertility. Under proper management they can be used for cultivation, for improved pasture, and for forest. Crop yields, however, are generally lower than on the soils of associations 1, 2, 3, and 4. The steeper slopes are very susceptible to erosion and, when cultivated, present serious problems of conservation. These soils are not well suited to intensive agricultural use.

Because of low productivity, large areas of this association remain in their natural state. In this county, a majority of the fields that were once cultivated and now abandoned are in this soil association.

Light-gray sands; sandy subsoils; excessively drained or somewhat excessively drained: Lakewood-Lakeland (9)

This soil association occurs in a limited area in the extreme southwestern part of the county. The Lakewood soils predominate; only a small acreage is Lakeland soil. The soils of this association are level to very gently sloping. The Lakeland soils differ from Lakewood primarily because they do not have a layer of white sand between the surface soil and the brownish-yellow sublayers.

These excessively drained deep sands contain very little organic matter. They are not suitable for agricultural use. Their productivity and fertility are extremely low. They produce poor forage and poor stands of trees. Some areas are used as building sites.

Sloping to Steep Soils on Uplands

The sloping to steep soils on the uplands in this county make up soil association 10. The association is made up of two undifferentiated mapping units, each of which contains the soils of several series.

Undifferentiated soils: Lakeland, Ruston, and Norfolk-Sunsweet, Carnegie, and Cuthbert (10)

This soil association is made up of two sets of undifferentiated mapping units, one consisting of Lakeland,

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Ruston, and Norfolk soils, and the other of Sunsweet, Carnegie, and Cuthbert soils. The aggregate area of the Lakeland, Ruston, and Norfolk soils is approximately five times that of the Sunsweet, Carnegie, and Cuthbert soils. The soils in both sets of mapping units are so closely associated that it was not practical to show them separately. In the association are small areas of other soils not mentioned in the name of the association.

The soils are mostly on steeper slopes along streams and drainageways. Those soils with finer textured profiles (Sunsweet, Carnegie, and Cuthbert) are adjacent to soils of the Irvington, Tifton, Carnegie, and Red Bay series. The areas with coarser textured profiles (Lakeland, Ruston, and Norfolk) are intricately mixed and occur adjacent to Eustis, Lakeland, Norfolk, and Ruston soils.

The soils of this association are very susceptible to erosion. Even with a cover of native vegetation, the soils on steeper slopes present serious problems in conservation. Surface runoff is high. Internal drainage varies with the texture of the underlying material. In places, there are outcrops of ironpan that make working the soils almost impossible.

Under proper management, the gently sloping areas can be used for pasture and limited cultivation for production of crops especially adapted to the soils. Practically all of the steeper areas are in forest, the use to which most of the land is probably best suited.

Nearly Level Soils of River Terraces, Depressions, and Lowlands

The soils of the county on terraces, in depressions, and on lowlands make up soil associations 6, 7, 8, 11, and 12.

Gray sandy soils on lowlands; somewhat poorly drained; moderately high water table: Klej-Leon (6)

This soil association occurs only in the southwestern part of the county. The soils are dominantly level to very gently sloping. The Klej soils predominate; their aggregate area is almost twice that of the Leon soils. Because the soils are nearly level and have a high water table, runoff is low and internal drainage is slow.

The Klej soils differ from the Leon in having a pale-yellow to brownish-yellow subsoil, instead of a dark reddish-brown or yellow subsoil. Also, the Leon soils have a leached layer and an organic-matter stained hardpan, which the Klej soils do not have.

The soils of this association are low in fertility, and only small areas have been cleared for agricultural use. Although the soils are low in organic matter and plant nutrients, they are fairly suitable for improved pasture if water is controlled and other management is good.

Gray or very dark gray fine sands; poorly drained: Plummer-Rutlege (7)

This soil association occurs mostly in nearly level areas in the southwestern part of the county. To lesser extent, however, it occurs in seepy areas adjacent to the Perdido River.

The Rutlege soils are dominant in the areas of this association in the southwestern part of the county, but in the seepy areas along the Perdido River, the Plummer soils are more extensive. The total acreage of the Plummer soil is considerably larger than that of the Rutlege.

The Rutlege soil has a thick, dark surface layer. The Plummer soils, in contrast, have a thin surface layer over light-gray sands.

The soils of this association are poorly and very poorly drained. There is practically no runoff. The poor drainage presents difficult problems in management. Almost all of the acreage in this association is under native cover, a sparse stand of timber. Only a few areas of these soils are desirable for agriculture under existing conditions.

Soils on river terraces; well drained or moderately well drained: Huckabee-Kalmia-Izagora (8)

This soil association is on the better drained level to very gently sloping stream terraces along the Escambia and Perdido Rivers. The Huckabee soils predominate; their aggregate is about twice that of the Kalmia or Izagora soils. The Huckabee soils are well drained and have rapid internal drainage. The Kalmia and Izagora soils are moderately well drained and have moderate internal drainage. The Huckabee soils have 30 to 72 inches of sandy material above finer textured material, whereas the Kalmia soils have less than 30 inches of sandy loam above finer textured material. The Izagora soils differ from Kalmia chiefly in being much finer textured in the lower layers.

Most of this association has not been cleared for agricultural use. The fertility of the soils is medium to low. Although they contain little organic matter and plant nutrients, these soils are fairly suitable for most crops. To maintain productivity, proper management is needed. Average to good yields of most crops can be produced. These soils are also well suited to plantings for improved pasture. Much of the acreage in this association is in forest. These forested areas can be considered as potential agricultural land.

Undifferentiated coastal soils bordering salt water: Coastal dune land and beach–Tidal marsh (11)

The two undifferentiated mapping units in this soil association occur as narrow strips adjacent to the Gulf of Mexico. Santa Rosa Island and Gulf Beach are composed entirely of these mapping units.

Tidal marsh differs from Coastal dune land and beach chiefly in being periodically inundated by tides. Tidal marsh is used mainly for wildlife. Coastal dune land and beach is used for recreation and building sites. This association has no agricultural value.

Undifferentiated poorly drained flood plains and swamps: Mixed alluvial land–Fresh water swamp (12)

This soil association occurs mostly as irregular strips of bottom land along the Escambia and Perdido Rivers and their tributaries. The aggregate area of Mixed alluvial land is many times that of Fresh water swamp. The areas are mainly level or nearly level, though some are very gently sloping.

Most of the Mixed alluvial land lies almost level with the water in adjacent streams and is frequently flooded. It consists of stratified stream sediments that have been washed chiefly from adjoining uplands but partly from

areas farther upstream. The deposits along the larger streams are sandy near the present streambanks. Adjacent to these sandy deposits are deposits of silty clay, clay, and stratified materials. The areas are somewhat poorly drained to very poorly drained.

Fresh water swamp consists of naturally wooded areas that are covered with water or are saturated much of the time. The areas are all in forest consisting dominantly of swamp hardwoods and a few scattered pines.

This soil association is not well suited to agricultural use.

Use, Management, and Estimated Yields

This section has three main parts. The first explains the system used in grouping soils according to their capability; the second places the soils in capability units, or groups of soils that need about the same kind of management and respond in about the same way; and the third gives estimated average acre yields for principal crops at two levels of management.

Capability Groups of Soils [3]

Capability grouping is a system of classification used to show the relative suitability of soils for crops, grazing, forestry, and wildlife. It is a practical grouping based on the needs and limitations of the soils, the risks of damage to them, and also their response to management. There are three levels above the soil mapping unit in this grouping. They are the capability unit, subclass, and class.

The capability unit, which can also be called a management group, is the lowest level of soil capability grouping. A capability unit is made up of soils similar in the kind of management they need, in risk of damage, and in general suitability for use.

The next broader grouping, the subclass, is used to indicate the dominant kind of limitation. The letter symbol "e" indicates that the main limiting factor is risk of erosion if the plant cover is not maintained; "w" means excess water that retards plant growth or interferes with cultivation; "s" shows that the soils are shallow, droughty, or generally low in fertility.

The broadest grouping, the land capability class, is identified by Roman numerals. All the soils in one class have limitations and management problems of about the same degree, but of different kinds, as shown by the subclass. All the land classes except class I may have one or more subclasses.

In classes I, II, and III are soils that are suitable for annual or periodic cultivation of annual or short-lived crops.

Class I soils are those that have the widest range of use and the least risk of damage. They are level, or nearly level, productive, well drained, and easy to work. They can be cultivated with almost no risk of erosion and will remain productive if managed with normal care.

Class II soils can be cultivated regularly, but do not have quite so wide a range of suitability as class I soils. Some class II soils are gently sloping; consequently, they need moderate care to prevent erosion. Other soils in class II may be slightly droughty, or slightly wet, or somewhat limited in depth.

Class III soils can be cropped regularly but have a narrower range of use. These need even more careful management.

In class IV are soils that have greater natural limitations than those in class III, but they can be cultivated for some crops under very careful management.

In classes V, VI, and VII are soils that normally should not be cultivated for annual or short-lived crops, but they can be used for pasture or range, for woodland, or for wildlife.

Class V soils are nearly level and gently sloping but are droughty, wet, low in fertility, or otherwise unsuitable for cultivation.

Class VI soils are not suitable for crops because they are steep or droughty or otherwise limited, but they give fair yields of forage or forest products. Some soils in class VI can, without damage, be cultivated enough so that fruit trees or forest trees can be set out or pasture crops seeded.

Class VII soils are not suitable for crops and only poorly suited to pasture; they are too steep, are droughty, or are otherwise limited. They are best suited to forest and produce fair to good yields of forest products.

In class VIII are soils that have practically no agricultural use. Some of them have value as watersheds, as wildlife habitats, or for recreation.

The soils of Escambia County have been grouped in the following capability classes, subclasses, and units:

Class I.—Nearly level productive soils that are very good for crops and other uses and have few limitations.
- Unit I–1.—Well-drained, nearly level soils that have fine sandy clay loam subsoil.
- Unit I–2.—Well-drained, nearly level soils that have subsoils with slightly greater moisture-holding capacity than the soils of unit I–1.

Class II.—Soils that have some limitations that reduce the choice of plants or require some conservation practices.

Subclass IIe.—Very gently sloping soils that are likely to erode if not protected.
- Unit IIe–1.—Well-drained, very gently sloping soils that have clay loam or fine sandy clay loam subsoils.
- Unit IIe–2.—Well-drained, very gently sloping soils that have subsoils with slightly greater moisture-holding capacity than the soils of unit IIe–1.
- Unit IIe–3.—Moderately well drained very gently sloping soils.

Subclass IIs.—Loamy sands that have moderate limitations because of low moisture-holding capacity.
- Unit IIs–1.—Loamy sands that do not have fine-textured subsoils within 18 inches of the surface.

Subclass IIw.—Moderately well drained soils in which excess water restricts the choice of crops or requires some corrective measures.
- Unit IIw–1.—Moderately well drained soils that have a high water table part of the time.

[3] By W. H. BUCKHANNAN, soil scientist, Soil Conservation Service.

Class III.—Soils that have severe limitations that reduce the choice of plants, or require special conservation practices, or both.
- Subclass IIIe.—Sloping soils that will erode if not protected.
  - Unit IIIe–1.—Well-drained, gently sloping soils that have clay loam or fine sandy clay loam subsoils.
  - Unit IIIe–2.—Well-drained, gently sloping soils that have subsoils with slightly greater moisture-holding capacity than those of unit IIIe–1.
- Subclass IIIs.—Soils severely limited by moderate or low moisture-holding capacity.
  - Unit IIIs–1.—Deep, well-drained loamy fine sands.
  - Unit IIIs–2.—Deep, moderately well drained to somewhat poorly drained loamy fine sands to sands.
- Subclass IIIw.—Soils severely limited by excess water.
  - Unit IIIw–1.—Somewhat poorly drained soils that are wet part of the time unless artificially drained.
  - Unit IIIw–2.—Very poorly drained, dark-colored soils that are suitable for cultivation if drained.

Class IV.—Soils that have very severe limitations that restrict the choice of plants, or require very careful management, or both.
- Subclass IVe.—Soils that will erode if not protected.
  - Unit IVe–1.—Gently sloping mixed soils, some highly erodible and having low moisture-holding capacity.
- Subclass IVs.—Soils severely limited by low moisture-holding capacity.
  - Unit IVs–1.—Sloping, deep, well-drained, coarse-textured sandy soils.
  - Unit IVs–2.—Nearly level to gently sloping, deep sandy soils.

Class V.—Soils that have limitations, other than erosion hazard, that limit their use largely to permanent cover.
- Subclass Vw.—Wet soils of low fertility that can be used for pasture or woodland.
  - Unit Vw–1.—Poorly to very poorly drained soils that are low in organic matter and fertility.
- Subclass Vs.—Sandy soils that can be used for pasture or woodland.
  - Unit Vs–1.—Somewhat poorly drained soils with an organic pan layer in the subsoil.

Class VI.—Soils that have severe limitations that make them generally unsuited to cultivation and limit their use largely to permanent cover.
- Subclass VIe.—Sloping soils highly susceptible to erosion.
  - Unit VIe–1.—Mixed very gently or gently sloping soils that are extremely erodible if not protected.
  - Unit VIe–2.—Sloping, deep, sandy soils.

Class VII.—Soils unsuitable for cultivation that have very severe limitations.
- Subclass VIIe.—Soils subject to rapid erosion if not protected.
  - Unit VIIe–1.—Sloping and strongly sloping mixed soils.
  - Unit VIIe–2.—Severely gullied or rough broken land.
- Subclass VIIs.—Dry soils that are low in fertility.
  - Unit VIIs–1.—Deep, somewhat excessively drained sandy soils.
  - Unit VIIs–2.—Deep, droughty sands.

Class VIII.—Soils not suitable for production of crops, grasses, or woody plants.
- Unit VIII–1.—Coastal dunes and tidal marsh.

Management by Capability Units

Soils in one capability unit have about the same limitations and similar risks of damage. The soils in one unit, therefore, need about the same kind of management, though they may have formed from different kinds of parent materials in different ways. The capability units are described in the following pages. The soils in each unit are listed and suitable management is suggested.

Capability unit I–1

In this unit are well-drained, nearly level soils that have fine sandy clay loam subsoil. They have 10- to 18-inch surface layers that contain little organic matter. These are underlain by moderately fine textured subsoils that range from 30 to 42 inches in thickness. The subsoils are thick and friable; are readily penetrated by plant roots, water, and air; and have high available moisture capacity. These soils are:

Blakely loam.
Kalmia fine sandy loam, level phase.
Norfolk fine sandy loam, level phase.
Red Bay fine sandy loam, level phase.
Ruston fine sandy loam, level phase.

The soils of this unit are especially well suited to the deep-rooted general farm crops commonly grown in the county and to nut and fruit trees.

These soils have no special limitations, but good farming is needed to maintain fertility and structure. Use a rotation that includes a sod crop; grow green-manure crops, preferably legumes; return to the soil straw, stalks, and other crop residues; and apply lime and fertilizer. Although these soils are not very susceptible to erosion, terraces may be required to carry off water that flows onto the soils where they adjoin more sloping land.

These soils can produce high yields of forest products, but because they are used for high-value cultivated crops and pasture, a very small acreage is forested. Longleaf pine is native. Practice good management—cut trees selectively, protect the areas from fire and overgrazing, and plant slash pine in unused areas.

The soils are well suited to produce food for wildlife, particularly the deep-rooted legumes. Although most of the areas that have these soils are cultivated, those in fence rows and field corners can be used to produce abundant brushy cover for wildlife.

Capability unit I–2

This capability unit consists of well-drained nearly level soils that have subsoils with slightly greater mois-

ture-holding capacity than the soils of unit I–1. They differ from the soils of unit I–1 principally in having slightly finer textured subsoils, slightly higher available moisture capacity, and slightly higher productivity. The soils of this unit are:

Carnegie fine sandy loam, level phase.
Faceville fine sandy loam, level phase.
Tifton fine sandy loam, level phase.

The soils of this capability unit are slightly more favorable to a wider range of legumes than the soils of capability unit I–1. Nevertheless, soils of the two units are alike in that they can be used intensively and are very slightly limited in capability. Management practices are similar.

The yields of forest products and the woodland management needed for soils of both units are very similar. The soils of both units are equally suitable as producers of food and cover for wildlife.

Capability unit IIe–1

In this capability unit are well-drained, very gently sloping soils that have clay loam or fine sandy clay loam subsoils. These soils are likely to erode if not protected.

The surface soils are moderately coarse textured and, in most places, range from about 12 to 18 inches in thickness. They merge with the friable, moderately fine textured, thick subsoils. Although these soils are well drained, and water moves through them freely, they have a fairly high available moisture capacity. Slopes range from 2 to 5 percent and are slightly to moderately susceptible to erosion by water. The soils in this capability unit are:

Kalmia fine sandy loam, very gently sloping phase.
Norfolk fine sandy loam, very gently sloping phase.
Red Bay fine sandy loam, very gently sloping phase.
Ruston fine sandy loam, very gently sloping phase.

The natural characteristics of these soils, and the ease with which high fertility and a favorable content of organic matter can be maintained, make them among the most productive in the county. Good management often requires that a complete water-control system be established to prevent erosion. Terraces and terrace outlets need to be properly constructed. But if good infiltration is maintained and proper tillage and contour cultivation are used, terraces are less essential on these friable soils than on those that have finer texture or more compact subsoils. Crop rotations that include a close-growing cover crop at least one-half the time will protect against excessive runoff and erosion and help to maintain organic matter and nitrogen. Appropriate quantities of lime and fertilizers need to be added.

These soils are well suited to grasses suitable for improved pasture, but a complete fertilizer and lime are required to obtain the best yields. Some of the most drought-resistant legumes can be grown, but these soils are not so suitable for legumes as the soils in capability unit IIe–2, which have subsoils of finer texture and a higher available moisture capacity.

These soils are well suited to produce forest products. Longleaf pine is the native tree, and slash pine grows well in reforested areas. Because of the high value of these soils for tilled crops, however, only a small acreage is used for forestry.

These soils are well suited to produce desirable feed plants for wildlife. Such plants need to be encouraged to grow along fence rows, borders of fields, and in field corners.

Capability unit IIe–2

In this capability unit are well-drained, very gently sloping soils that have subsoils with slightly greater moisture-holding capacity than the soils of unit IIe–1. The soils of unit IIe–2 have surface soils that are moderately coarse textured and that are underlain by fine-textured subsoils. The soils are:

Carnegie fine sandy loam, very gently sloping phase.
Carnegie fine sandy loam, eroded very gently sloping phase.
Faceville fine sandy loam, very gently sloping phase.
Tifton fine sandy loam, very gently sloping phase.

The soils of this unit are easily cultivated and among them are some of the most productive, well-drained soils of the county. In use and management they are generally comparable to the soils of capability unit IIe–1, but they are capable of maintaining a higher level of productivity than soils of that unit. These soils differ from those of capability unit IIe–1 principally because they have subsoils of slightly finer texture, which causes some difference in suitability for crops and in management practices needed.

Since these soils are slightly more erodible than those of capability unit IIe–1, adequate water control is more essential. Needed are terraces, protected terrace outlets, and waterways, and proper crop rotations. Close-growing cover crops, including legumes, ought to be on the soils at least half the time. A good litter of organic material on the surface will help increase infiltration and reduce erosion.

In comparison with the soils of unit IIe–1, the soils of this unit are better for legumes and other general farm crops that require more moisture. To maintain high yields, lime is needed, especially for legumes, and a complete fertilizer is required. These soils produce good grass-legume mixtures and, therefore, have high value as pasture.

Longleaf pine is native, and yields of all forest products are high. Plantings of slash pine grow well, but few areas now produce trees because they are preferred for cultivated crops.

Most of the acreage in this unit is cultivated or in improved pasture, but the remaining uncleared areas, field corners, and fence rows are excellent places to produce plants that will provide feed and shelter for wildlife.

Capability unit IIe–3

This capability unit is made up of moderately well drained very gently sloping soils. Their moderately coarse textured surface soils, grayish brown to dark grayish brown in color, are about 5 inches thick. They merge with yellowish-brown to light yellowish-brown subsurface layers that are of similar texture and 6 to 10 inches thick. Below these depths the subsoils are yellow to brownish-yellow friable material of moderately fine texture. At depths of about 36 inches the subsoils grade to mottled material that is either of slightly finer texture or more compact. This finer or more compact material

tends to restrict internal drainage. These soils have slopes that range from 2 to 5 percent. They are:

Angie fine sandy loam, very gently sloping phase.
Savannah fine sandy loam, very gently sloping thick solum phase.

The dominant hazard in management of these soils is susceptibility to erosion. Adequate water control is even more essential than for the soils of capability unit IIe–2, not only because these soils have a slowly permeable subsoil, but also because they have a fairly high water table. Simple practices, however, will overcome these limitations. Establish a complete water-control system that includes properly constructed terraces, provides protected outlets and other necessary waterways, and keeps a plant cover on the soils at least half the time. These practices and appropriate fertilization are most satisfactory for maximum protection and production. On short slopes, contour tillage and return of good cover crops to the soil are sufficient protection. Periodic additions of organic matter increase the infiltration rate, improve the ability of the soil to retain water, furnish nitrogen for the growing crop, and help to prevent rapid loss of commercial fertilizer.

The soils are well suited to high-value pasture mixtures. Forage crops, particularly legumes, are well suited, especially during extended droughts. To maintain high yields of forage crops a complete fertilizer and lime are needed. The legumes, especially, need the lime.

Yields of forest products are high. Longleaf pine is native. Slash pine grows well and is the most suitable for reforesting. Good forestry management includes fire control, selective cutting of trees, and protection from overgrazing.

The soils of this capability unit are well suited to the production of feed plants for wildlife. More of the acreage is uncleared than on unit IIe–2 and, therefore, can be improved as a habitat for wildlife. Good wildlife management includes improvement of feed and cover along fence rows, along field borders, and in areas under native vegetation.

Capability unit IIs–1

The soils of this capability unit are loamy sands that have fine-textured subsoils at depths greater than 18 inches. They are well drained and well suited to general farm crops. However, a few adverse characteristics somewhat limit their capacity to produce permanent high yields. These soils have almost no slope, and runoff is not a hazard. Water moves through these soils freely; their capacity to hold water is low to moderately low. The soils in this unit are:

Eustis loamy fine sand, level phase.
Eustis loamy sand, level phase.
Huckabee loamy fine sand, level phase.
Lakeland loamy fine sand, level phase.
Lakeland loamy sand, level phase.
Red Bay loamy fine sand, level thick surface phase.
Ruston loamy fine sand, level thick surface phase.

These soils require fertilizer and maximum use of soil-building crops to maintain as large an amount of organic matter as possible. Cover crops should occupy the land half the time and be returned to the soil. These soils are susceptible to wind erosion, especially during critical stages of crop growth; consequently, good management requires a cultivation that leaves at least part of the plant residue on the surface. Spring furrowing and stripcropping (planting of close-growing crops in alternate strips) may be required to prevent blowing of the soils in larger clean-tilled fields.

These soils contain a fairly small amount of plant nutrients, but they can be managed so as to obtain fairly high yields of nearly all general farm crops. This requires additions of organic matter by growing crops that improve the soil and by applying adequate lime and fertilizer.

These soils are suited to only the most drought-resistant and deep-rooted legumes. Improved pasture grasses, especially the more deeply rooted grasses, grow well if fertilizer and lime are liberally applied.

Yields of forest products are moderately high to high. Longleaf pine is the dominant native tree. Plantings of slash pine grow well. Good management for obtaining maximum yields includes protection from fire, planting of pine in sites unfavorable for natural reseeding, and selective cutting and thinning of undesirable hardwoods.

Legumes that are drought resistant and deep rooted are suitable for producing good yields of desirable feed for wildlife. Uncleared areas and field borders or fence rows and field corners should be managed so as to produce cover and feed for wildlife.

Capability unit IIw–1

This capability unit consists of moderately well drained soils that have a high water table part of the time. They have moderately coarse textured surface soils about 10 to 18 inches thick that merge into moderately fine textured subsoils that have some compaction at lower depths. These soils are:

Irvington fine sandy loam.
Izagora fine sandy loam.
Savannah fine sandy loam, level thick solum phase.

These soils are well suited to many kinds of cultivated crops and to improved pasture, but for some crops their use is limited by periodic wetness. The lack of drainage, or high water table, limits their use for crops that are most sensitive to moisture but makes them suitable for crops that require large amounts of water. The Irvington and Savannah soils are used much more extensively for vegetables than the Izagora soil.

Slow drainage delays cultivation following heavy rains. The soils must be carefully tilled at the right time; otherwise, they will puddle. Puddling can be decreased by growing cover crops that add large amounts of organic matter. Because of the slow internal drainage, the soils are cold and crops germinate slowly in spring. Crop rotations should keep legume cover crops on the soil half the time.

Nearly all cultivated crops require simple measures that will prevent extensive saturation of the soils during periods of high rainfall. These soils, however, are not so wet that drainage is necessary for improved pasture. These soils are well suited to the production of a balanced mixture of grasses and legumes; they respond favorably to lime and fertilizer and have fairly good moisture conditions for most of the year.

The yield of forest products is high. Longleaf pine is the dominant native tree, but plantings of slash pine grow exceptionally well. Yields of feed for wildlife are

favorable, especially where suitable legumes and other plants are established and properly managed. Most areas of these soils are adjacent to poorly drained, wooded areas that produce cover for wildlife.

Capability unit IIIe–1

In this capability unit are well-drained, gently sloping soils that have clay loam or fine sandy clay loam subsoils. They are suitable for cultivation but are more susceptible to erosion because slopes range from 5 to 8 percent. The soils are uniformly thick and are permeable to roots and water. Their surface soils—moderately coarse textured and 12 to 18 inches thick—are underlain by friable, moderately fine textured subsoils that have a high available moisture capacity. The soils of this unit are:

Norfolk fine sandy loam, gently sloping phase.
Red Bay fine sandy loam, gently sloping phase.
Ruston fine sandy loam, gently sloping phase.

These soils are suitable for many kinds of farm crops. They have permanent hazards if cultivated continuously, but they respond favorably if soil building and conserving practices are applied. These soils do not have much erosion, but in a few areas moderately eroded spots are included.

To maintain long-time production, these soils need good crop rotations and a complete water-disposal system. An adequate cropping system includes growing and plowing under of green-manure crops in a rotation that keeps close-growing crops on the soils two-thirds of the time. Also, terraces are spaced at closer intervals than on soils of class IIe–1. Terrace outlets and waterways are protected by grass. Emphasis is placed on contour cultivation and planting perennial vegetation at intervals or in contoured strips, particularly on the longer slopes. Rotations consisting mainly of sod crops are especially effective in decreasing erosion on the long slopes.

These soils are suitable for nearly all general farm crops. Yields correspond to those on soils of capability unit IIe–1 if management is adequate. The soils are suitable for the most drought-resistant legumes and are very suitable for nearly all grasses used in improved pastures. Liberal applications of lime and fertilizer are required for optimum yields.

Yields of forest products are high, but only a small part of the total acreage is in trees. Longleaf pine is the dominant native tree. Slash pine grows well and is probably the most desirable for reforestation. Forest management described for soils of capability unit IIe–1 also applies to soils of this unit.

These soils are well suited to the production of feed and cover for wildlife; legumes that produce feed for wildlife grow well. Such plants should be encouraged to grow in field borders and corners and in other unused areas.

Capability unit IIIe–2

This capability unit contains well-drained, gently sloping soils. Their subsoils have a slightly greater moisture-holding capacity than those of unit IIIe–1. The moderately coarse surface soils are underlain at depths of 10 to 18 inches by thick subsoils of moderately fine to fine texture. Although the subsoils are readily permeable to roots, water moves through them more slowly than in the soils of capability unit IIIe–1. Because of this, runoff is greater and the soils are more susceptible to erosion when cultivated. They have a fairly high available moisture capacity, and crops withstand droughts better than on soils of unit IIIe–1. The soils of this capability unit are as follows:

Carnegie fine sandy loam, gently sloping phase.
Carnegie fine sandy loam, eroded gently sloping phase.
Tifton fine sandy loam, gently sloping phase.

These soils are naturally productive and are well suited to nearly all general farm crops. Under comparable management, yields of all crops are higher than on soils of unit IIIe–1. These soils, however, are rapidly depleted if good management is not followed. This is especially true if the soils are used mainly to produce row or intertilled crops. If they have been cultivated for a long time and have not been properly managed, many of these soils are seriously eroded or otherwise depleted. Nevertheless, increased yields and general improvement of the soils are possible, even in the most severely depleted areas.

Since permeability is somewhat restricted and the soils are sloping, intensive control of erosion is necessary. A complete water-disposal system that includes terraces, contour tillage, and suitable outlets is also necessary. Maximum use of summer and winter cover crops is needed to improve the tilth of the soils and to increase intake of water. Rotations made up mainly of sod crops are particularly effective, even on the areas most susceptible to erosion. Lime and fertilizers are essential, and close-growing crops ought to be on the soils at least two-thirds of the time. It is important that all crop residues be left on the land.

Most grasses and legumes suitable for improved pasture will grow well on these soils if they are properly fertilized and managed. The soils are particularly suitable for high-quality pasture.

Forest products yield well, and a fairly large acreage is in trees. The native tree is longleaf pine, but plantings of slash pine also grow well.

The soils are well suited to produce feed and cover for wildlife. Uncleared areas and fence rows or field borders and corners are favorable sites for this use.

Capability unit IIIs–1

This unit consists of deep, well-drained loamy fine sands. Most of the soils have a coarse or moderately coarse subsoil and a moderate or moderately low capacity to hold moisture available to plants. Some of the mapping units consist partly of soils that have finer textured subsoils and a high available moisture capacity. Slopes range from 2 to 5 percent. The soils are:

Eustis loamy fine sand, very gently sloping phase.
Eustis loamy sand, very gently sloping phase.
Huckabee loamy fine sand, very gently sloping phase.
Lakeland loamy fine sand, very gently sloping phase.
Lakeland loamy sand, very gently sloping phase.
Lakeland, Ruston, and Norfolk soils, very gently sloping phases.
Red Bay loamy fine sand, very gently sloping thick surface phase.
Ruston loamy fine sand, very gently sloping thick surface phase.

In general, these soils produce less than the soils of subclass IIIe and are severely limited in suitability for

crops that require lots of moisture. They are best for crops that require little moisture. Because of low moisture-holding capacity, crops are damaged by drought. Favorable growth is limited to seasons of high rainfall. Intensive soil-building and soil-conserving practices are essential if good yields are to be maintained under continued cultivation. Fairly high yields of deep-rooted crops are obtained if cover crops that include legumes are kept on these soils two-thirds of the time and if adequate applications of lime and fertilizers are used.

Water erosion is a definite problem, particularly on the longer slopes. A complete water-disposal system is required to prevent loss of soil by excessive runoff, especially if clean-tilled crops are grown in areas that have subsoils of moderately fine texture. Green-manure crops or established sods turned into the soils will add organic matter, increase the capacity of the soils to hold moisture, and help prevent excessive leaching of plant nutrients.

Wind erosion is a hazard in many places, particularly in large, open fields. Crop residues left on the surface will greatly reduce this hazard. Where wind erosion is serious, alternate strips of vegetation need to be maintained while the soil between the strips is clean tilled.

Deep-rooted pasture grasses are adapted to these soils, but for high yields fertilizers need to be applied liberally during periods of most abundant rainfall. Although the more drought-resistant legumes grow fairly well, high-quality pastures of mixed grasses and legumes are more difficult to establish and maintain on these soils than on soils of capability units IIIe–1 and IIIe–2. However, good sods can be established and are an important means by which the soils can be protected and the amount of their organic matter increased. Rotation of dense sod with tilled crops is a means of keeping the soils at highest productivity.

Longleaf pine is the dominant native tree. Slash pine grows well and is the most desirable for reforestation. Moderately high to high yields of forest products are obtained if the stands are protected from fire and overgrazing and the trees are selectively cut or thinned.

These soils are somewhat limited in their suitability for some of the legumes that produce desirable feed for wildlife. If a suitable legume is selected and is fertilized and protected from fire and overgrazing, it will produce well. The rather large number of uncleared areas and the field borders and corners are places suitable for growing feed and cover for wildlife.

Capability unit IIIs–2

The level to very gently sloping soils of this capability unit are deep, moderately well drained to somewhat poorly drained loamy fine sands to sands. They are coarse textured to depths of more than 42 inches, and their capacity to hold moisture available for plants is low. These soils are:

Barth loamy fine sand.
Klej loamy sand, level phase.
Klej loamy sand, very gently sloping phase.
Klej sand, level phase.
Klej sand, very gently sloping phase.

The water table is in the lower part of the subsoil most of the year, and during heavy rainfall it rises to near the surface. The fluctuating height of the water table tends to restrict deep root growth and the ability of the plants to obtain moisture from the lower depths during long droughts. Water control generally is needed only where crops are grown that have little tolerance for excess moisture. Such control is accomplished by digging shallow, open drainage ditches.

Organic matter and plant nutrients are so rapidly leached from these soils that intensive use of soil-building crops is required. High yields are limited principally by low fertility and low available moisture capacity. Maximum yields require intensive use of crop rotations and liberal applications of lime and fertilizer.

These soils are not suited to so many kinds of crops as the well-drained soils of class III. The crops most suitable are those that tolerate wetness during periods of heavy rainfall. Fairly high yields of forage or pasture are possible if lime and a complete fertilizer are liberally applied.

Yields of forest products are fairly high. Plantings of slash pine grow well. Good forest management is necessary to encourage reproduction and the growth of longleaf pine, slash pine, and other desirable species. Needed practices are planting of slash pine, selective cutting of trees, and protection from fire and overgrazing.

Many areas are especially well suited to produce feed and cover for wildlife. Good management includes selection of suitable plants, addition of fertilizer, and protection from fire and overgrazing.

Capability unit IIIw–1

In this unit are somewhat poorly drained soils that are wet part of the time unless artificially drained. The surface soils are moderately coarse in texture and contain a moderate amount of organic matter. The surface layers, at depths of 12 to 18 inches, are underlain by friable moderately fine textured subsoils.

These soils have a high available moisture capacity. The slopes are normally 2 percent or less, but in a few places they range up to slightly more than 5 percent. The soils in this unit are:

Lynchburg fine sandy loam, level phase.
Lynchburg fine sandy loam, very gently sloping phase.
Lynchburg gravelly very fine sandy loam.
Stough fine sandy loam.

The subsoils are periodically wet or waterlogged; therefore, intensive management is needed to control water. The more sloping areas are susceptible to erosion, particularly gullying, so control of surface runoff may be needed. These soils are inherently low in plant nutrients and contain little organic matter. They rapidly lose their limited content of both during cultivation. Good management includes liberal applications of fertilizer and use of crop rotations that periodically add large amounts of organic matter to the soil.

The water table fluctuates between depths of 2 and 4 feet and, on the average, is about 30 inches from the surface. The water table, slight relief, low position, and rather slowly permeable subsoil, make drainage and water control difficult. The soils, however, are suitable for subirrigation where the surface layer is about 18 inches thick. A system of properly designed shallow ditches, with simple structures to control flow, will provide both subirrigation and drainage.

These soils, if properly drained, will still hold ample water for most general farm crops. Permanent high

yields of suitable tilled crops can be obtained under good management, which requires intensive use of soil-building cover crops and additions of fertilizer and lime.

These soils are particularly suitable for grass pasture. Shallow-rooted clovers produce well except during periods of extreme drought. Good pastures of mixed legumes and grass generally can be obtained. If pastures are to be good, adequate use of lime and fertilizer and proper control of water are necessary.

High yields of forest products are obtained on these soils. They are well suited to longleaf and slash pines. Good management includes protection from fire, selective cutting of trees, and planting of slash pine in sites unfavorable for natural reseeding.

These soils will produce feed and cover for wildlife. The fairly abundant supply of moisture throughout most of the year encourages growth of the legumes that are most desirable as wildlife feed. These legumes need fertilizer and protection from overgrazing and fire. Most of these soils are uncleared and provide good wildlife habitats.

Capability unit IIIw–2

This capability unit contains very poorly drained, dark-colored soils that are suitable for cultivation if drained. They have black, coarse- to medium-textured surface soils that contain large to very large amounts of organic matter and nitrogen and are more than 6 inches thick. The soils are very low in plant nutrients other than nitrogen. Their subsoils are either muck or coarse to moderately fine textured mineral material. The soils in this unit are:

Rutlege sand.
Pamlico muck.
Portsmouth loam.

The soils in this unit are quite different in some characteristics, but they are enough alike to require similar use and management.

Controlled drainage is necessary because the natural water table remains within a few inches of the surface for long periods each year and frequently rises above the surface. A good water-control system, with properly designed ditches and locks, will regulate the level of the water. It will function as a drainage system during wet seasons and as a subirrigation system during dry seasons. Because of differences in texture, these soils have wide differences in available moisture capacity. This is not so important as in the well-drained soils, because water is available from the high water table.

If properly drained, these soils are well suited to water-tolerant or shallow-rooted crops. Under good management, yields of cultivated crops and pasture are high. These soils are especially suitable for truck crops, grasses, and legumes that require lots of water. Mixtures of grasses and shallow-rooted legumes produce high yields of good-quality pasture. Soils of this unit require fertilizer and lime in amounts appropriate for the crop grown; they are generally deficient in both major and minor elements.

Uncleared areas of these soils support a heavy growth of water-tolerant hardwoods. Most of these grow slowly and are of little commercial value. Water control is essential for high yields of slash pine and the more desirable forest products. Other good management practices also needed are thinning of undesirable trees, selective cutting, and fire control.

In their natural state these soils provide fairly good cover and feed for wildlife. Where water control is established, wildlife feed can be increased by planting suitable feed plants.

Capability unit IVe–1

In this capability unit are gently sloping mixed soils, some highly erodible and having low moisture-holding capacity. They are on slopes of 5 to 8 percent. They are well drained to somewhat excessively drained, have coarse to moderately coarse textured surface soils, and have subsoils that range from coarse to moderately fine. These soils are:

Lakeland, Ruston, and Norfolk soils, gently sloping phases.
Lakeland, Ruston, and Norfolk soils, eroded gently sloping phases.

These soils are similar to those of capability units IIIe–1 and IIIs–1, but they are more difficult to manage because of their mixed pattern and generally stronger slopes.

These soils produce moderate to high yields of adapted crops under proper management, but they are too erodible for continuous cultivation. They should be kept in close-growing cover crops at least three-fourths of the time. Terraces would be necessary for more intensive cultivation on slopes as strong as these. Terraces, however, are too difficult to maintain in most areas because of the wide range in texture of the surface soils and subsoils. These soils respond better to sod-base rotations. Establish a good improved grass sod after a tilled crop, and let the sod remain 3 years or more before growing the next cultivated crop.

These soils are best suited to pasture or forestry. High-quality pasture can be established and maintained under simple management. Most areas have good internal moisture conditions and respond well to fertilizer and lime. Several kinds of improved grass will produce good yields and provide a good protective cover. Good management includes liberal applications of fertilizer and lime and controlled grazing.

The native vegetation is mostly longleaf pine. Slash pine grows rapidly and, in several respects, is a better tree for reforestation. For good forest management, plant seedlings in areas where natural reseeding is poor, remove trees of undesirable species, harvest selectively, and protect the areas from fire and overgrazing.

Many undeveloped areas of cutover woodland provide feed and cover for wildlife. Wildlife populations can be increased under well-planned management. Good feed plants for many kinds of wildlife grow well on these soils. Such plants need to be encouraged; the areas need to be planted, fertilized, and protected from fire and grazing.

Capability unit IVs–1

The soils of this capability unit are sloping, deep, sandy, well drained, and coarse textured. Slopes range from 5 to 8 percent. They have moderately low to low available moisture capacity and low native fertility. These soils are:

Eustis loamy fine sand, gently sloping phase.
Eustis loamy sand, gently sloping phase.

Lakeland loamy fine sand, gently sloping phase.
Lakeland loamy sand, gently sloping phase.
Red Bay loamy fine sand, gently sloping thick surface phase.
Ruston loamy fine sand, gently sloping thick surface phase.

To depths of more than 18 inches, these are loamy sands that contain little organic matter. They are susceptible to erosion and require contour cultivation and frequent use of cover crops or green-manure crops. Terraces and terrace outlets are difficult to maintain and are not recommended. Only the more drought-resistant crops are suitable. These soils can produce at higher levels only if fertilizer is liberally applied and soil-improving crops are on them at least 3 years out of 4.

These soils are moderately well suited to improved pasture. Deep-rooted, drought-resistant, improved grasses are suitable. These grasses require liberal applications of lime and fertilizer. Few legumes are well suited to these soils; consequently, it is normally not practical to attempt growing grass-legume mixtures. The heavy sod on a well-managed, improved grass pasture gives ample protection from erosion.

These soils are suitable for pine trees. The native vegetation is dominantly longleaf pine, which grows well. Slash pine is also suitable and, in several respects, is more desirable for reforestation than longleaf. Good management practices include planting of seedlings in areas where natural reseeding is poor, control of fire and overgrazing, and selective cutting.

Improving feed and cover for wildlife is a part of good management. Suitable plants can be grown along field borders and fence rows and in open forested areas. They need to be protected from fire and overgrazing.

Capability unit IVs–2

This capability unit consists of nearly level to gently sloping, deep sandy soils. They are loose and porous, are somewhat excessively drained, and hold little water for use of plants. These soils are:

Eustis sand, level phase.
Eustis sand, very gently sloping phase.
Lakeland sand, level phase.
Lakeland sand, very gently sloping phase.
Lakeland sand, gently sloping phase.

These soils are very low in native fertility, and leaching is rapid. There is some hazard of erosion on the more sloping areas. These soils are suitable for pasture and forest but only occasionally, under good management, will they support tilled crops.

These soils can be somewhat improved by intensive use of soil-building crops that constantly replenish the organic matter. Such crops should be used at least 3 years out of 4 in a rotation that includes tilled crops. The vegetation produced by these cover crops should be turned into the soil in a way that will leave part of it on the surface to retard erosion. These soils are not suitable for terracing. Even under the best management, leaching is rapid. Adequate and frequent applications of fertilizer are needed for each crop. The most drought-resistant crops make fair yields. Quick-growing crops planted to take advantage of seasons of frequent rains, and a few drought-resistant specialized crops, do better; but yields of most general farm crops are low, even with good management.

These soils are somewhat restricted in their suitability for pasture. A few drought-resistant grasses make fair growth during rainy seasons if lime and fertilizer are used liberally.

Pine trees do not grow so rapidly as on many other soils in the county, but pine production is one of the best uses for these soils. Good forest management includes planting of seedlings where natural reproduction is poor, selective harvesting, removal of undesirable hardwoods, and protection from fire and overgrazing. Better tree stands can be obtained and early growth is more rapid in old fields or other sites where competing scrubby vegetation has been eliminated.

Much of this unit consists of undeveloped woodland and offers limited feed and shelter for many kinds of wildlife. A much higher wildlife population could be maintained if feed plants were grown in selected locations and protected from fire and overgrazing.

Capability unit Vw–1

The soils of this capability unit are poorly to very poorly drained and low in organic matter and fertility. Their surface soils range from coarse to medium in texture, and their subsoils, from coarse to fine. These soils have low to moderate available moisture capacity. They are:

Grady loam.
Myatt very fine sandy loam, level phase.
Myatt very fine sandy loam, very gently sloping phase.
Myatt loamy fine sand, thick surface phase.
Plummer loamy sand, level phase.
Plummer loamy sand, very gently sloping phase.
Plummer fine sand.
Plummer sand.
Portsmouth, Grady, and Bayboro soils.
Wahee very fine sandy loam.

These soils vary considerably in texture, both in their surface soils and subsoils. They have low to high organic-matter content. Excessive wetness is the dominant limitation common to all. Some of these soils produce more than others. The productivity and response to fertilizers is greater for those of finer texture or high organic-matter content.

These soils are very difficult to drain satisfactorily because of low position, high water table, or seepage, and poor drainage outlets. Adequate water control for cultivated crops is very complex and generally not feasible.

Where suitable drainage outlets are available, simple water-control systems c anbe devised that will permit establishing and maintaining improved pasture. A pasture consisting of improved pasture grasses and legumes will provide high-quality grazing if fertilizer and lime are applied.

The natural forest cover varies widely, but slash pine predominates. In the very poorly drained areas, yields from water-tolerant hardwoods are low or very low. In the better drained areas that have subsoils of fine texture, yields of longleaf and slash pines are high. Good forest management includes water control, fire control, selective cutting, thinning of undesirable hardwoods, and planting of slash pine in areas of poor natural reseeding. Water control improves conditions for natural reseeding, survival of plantings, and growth.

Extensive areas of these soils are undeveloped and are favorable for wildlife. Much higher wildlife populations can be maintained under good management prac-

tices, which include water control in the more poorly drained areas, planting of suitable feed plants, proper fertilizing, and protection from fire and overgrazing.

Capability unit Vs–1

These are somewhat poorly drained soils with an organic pan layer in the subsoil. They are coarse textured throughout and are characterized by dark-gray, thin surface soils with very little organic matter. These are underlain by light-gray subsoils and, at depths ranging from about 20 to 30 inches, by dark reddish-brown organic pans that vary in denseness and thickness within a short distance. These soils have very low fertility and low available moisture capacity. The level of the water table fluctuates; plants get too much moisture in wet seasons and too little in dry seasons. The soils of this unit are:

Leon sand.
Leon sand, light colored surface phase.

Use of these soils is restricted to forest, to improved pasture, or to a limited amount of grazing in their natural state. The organic pan and the fluctuating water table hinder deep penetration of roots. Fairly good pasture of adapted grasses can be developed, however, if lime and fertilizer are liberally applied. A system of properly designed shallow ditches with simple control structures provides adequate water control for a wide range of forage crops, including a few adapted legumes. Generally, though, except in the lowest lying areas, this soil is not suitable for most legumes.

The native trees are dominantly longleaf pine, but slash pine grows better and is preferred for reforestation. Yields of forest products are generally moderate, but they are fairly high under good management, which includes fire control, selective cutting of trees, restocking by planting slash pine in areas of poor natural reseeding, and protection from overgrazing.

Extensive areas have not been developed, and they provide some cover and feed for wildlife under natural conditions. More feed can be made available by careful management—growing adapted feed plants, adding fertilizer, and protecting the areas from fire and grazing.

Capability unit VIe–1

In this capability unit are mixed very gently or gently sloping soils that are extremely erodible if not protected. They vary widely in their characteristics, and they occur as small, intricately associated areas. They differ greatly in depth, texture of subsoil, and permeability to roots, air, and water. These soils are:

Sunsweet, Carnegie, and Cuthbert soils, very gently sloping phases.
Sunsweet, Carnegie, and Cuthbert soils, gently sloping phases.

In these intricately intermingled areas of contrasting soils, the shallowest or least permeable soil is the one considered in determining limitations in use and treatment. The soils are not used for cultivated crops, because of susceptibility to erosion or other permanent limitations and hazards.

These soils are fairly suitable for improved pastures, but if planted to improved grasses, the soils need protection while the grasses are becoming established. They are susceptible to sheet and gully erosion and, in some places, may require diversion ditches. Because erosion is a continuing hazard, complete vegetative cover or crop residues need to cover the soils throughout the year. Because runoff is rapid and the soils are droughty in most places, only drought-resistant vegetation is suitable. Good improved pastures can be maintained on these soils where proper erosion control is established, adapted grasses are planted, and liberal applications of fertilizer are used. Yields are highest in seasons of most abundant rainfall. Adapted legumes can be grown successfully only under good management. Because of intricate local variations in the soils and extreme differences in their suitability, only fair yields from legumes can be expected.

Since these soils are so susceptible to erosion, they probably are best for forestry. In general, yields of forest products are moderately high to high. Longleaf pine is the native tree, but plantings of slash pine grow well. For maximum production, good forestry practices are required. These include planting of slash pine where native pine trees do not reseed, protection from fire and grazing, and selective cutting or thinning of undesirable trees.

Under natural conditions these soils provide good cover and some feed for wildlife. Good wildlife management includes planting and fertilizing suitable feed plants in selected sites.

Capability unit VIe–2

This capability unit consists of deep, sandy soils. Their texture is coarse. In a few small widely scattered areas, however, the surface soil is coarse but the subsoil is of moderately fine texture. These soils are well drained. Permeability is rapid. Their available moisture capacity is low, except in the small, widely scattered areas where the subsoils are of moderately fine texture. Slopes range from 8 to 12 percent. These soils are:

Eustis loamy fine sand, sloping phase.
Eustis loamy sand, sloping phase.
Lakeland loamy fine sand, sloping phase.
Lakeland loamy sand, sloping phase.
Lakeland, Ruston, and Norfolk soils, eroded sloping phases.

These soils have a low content of organic matter and low fertility. In a few places, particularly where the soils have moderately fine textured subsoils, the soils are slightly to moderately eroded.

These soils have strong slopes and are susceptible to erosion. They are not suitable for cultivation. Water control measures, such as terracing, would be required, and their loose sandy nature makes them very unsuitable for terraces. These soils respond poorly to soil improvement practices and produce little. Because of these limitations and hazards, the soils of this capability unit are probably best for permanent pasture or forest.

Drought-resistant, deep-rooted, improved pasture grasses are adapted to these soils. The soils are not suitable for legumes, and high-quality grass-legume pastures are difficult to establish and maintain. Good yields of adapted grasses can be obtained if they are planted during periods of the most abundant rainfall, and lime and fertilizers are liberally applied. There is little damage from erosion where the grasses are established in alternate strips.

Yields of forest products are fairly high, but proper forest management is necessary to obtain them. This in-

cludes the encouragement of natural reproduction and growth of desirable forest species such as longleaf pine, planting of slash pine in areas where natural reproduction of other desirable forest species is not favorable, selective cutting of trees, and control of fire and grazing.

These soils are fairly suitable for production of feed and cover for wildlife. Good management includes planting and encouraging reproduction of adapted plants, adding adequate fertilizer, and protecting the areas from fire and grazing.

Capability unit VIIe-1

In this capability unit are sloping and strongly sloping mixed soils. Although they differ widely in many characteristics, they are similar in steepness of slope, degree of erosion, texture of subsoils, and suitability. These soils are:

Lakeland, Ruston, and Norfolk soils, eroded strongly sloping phases.
Sunsweet, Carnegie, and Cuthbert soils, eroded sloping phases.
Sunsweet, Carnegie, and Cuthbert soils, severely eroded sloping phases.

Steepness of slope, combined with the shallowness to the slowly permeable subsoils, make these soils susceptible to rapid runoff and severe accelerated erosion. If they are used for cultivated crops, they will deteriorate severely and permanently. They are of limited value for pasture.

These soils require a year round cover of perennials. They can be pastured if grazing is carefully controlled and the grasses are adequately fertilized to assure complete cover. In many places, however, slopes and gullies do not permit use of machinery to properly establish plantings and to carry on necessary maintenance. Strongly sloping and gullied areas need to be reforested and carefully managed as woodland.

In general, these soils are best suited to forestry, and yields of forest products, especially under good management, are moderately high to high. These practices include planting of slash pine in areas that reseed poorly, selective cutting of trees, and control of fire and grazing.

Much of the acreage is in woodland and provides a good habitat for wildlife. Wildlife populations can be increased by management that includes growing feed plants in selected sites, fertilizing, and protecting the areas from fire and grazing.

Capability unit VIIe-2

This capability unit is comprised of severely gullied or rough broken land. It includes a wide range of soils and soil materials not specifically classified. The mapping units are:

Gullied land.
Rough broken land.

These lands are so deeply cut by eroded gullies, and slopes are so steep, that cultivation by tractor-drawn farm implements is not feasible. Use and management practices for these lands are confined almost entirely to those used in forestry. Management is emphasized that will best prevent erosion and stabilize gullies. The kind of management and difficulties to overcome vary in individual areas. Some gullies are very difficult to control, especially if they have cut deeply into soft materials.

The dominant management practices needed for this land include diversion of water from affected areas; planting of trees, shrubs, or other strong-rooted perennials; and protection of the established vegetation from fire and grazing. Special control structures may need to be established in the gullies most difficult to control.

Much of this land is not suitable for commercial forestry because of difficulties in harvesting the forest products. To stabilize the soil, slash pine or other adapted plants need to be spot planted, and natural vegetation needs to be encouraged. These areas, under proper management, will produce suitable cover and feed for wildlife.

Capability unit VIIs-1

In this capability unit are deep, somewhat excessively drained sandy soils. Their texture is coarse to depths of more than 42 inches. They have very low available moisture capacity and are very low in fertility. The slopes are 8 percent or more. These soils are:

Eustis sand, sloping phase.
Lakeland sand, sloping phase.

The water table in these soils normally is several feet below the surface, and the soils are very droughty. They are not only unsuitable for cultivation but are also severely limited for other uses.

These soils provide some grazing of native grasses, but severe restrictions are necessary to prevent overgrazing, which results in loss of cover and increased susceptibility to erosion. To establish improved pasture on these soils, contour tillage and planting in alternate strips is required. Improved pastures also require restricted grazing in order to maintain a plant cover throughout the year.

Good management of woodland includes practices that provide reseeding of the desirable and adapted trees, protection from fire and grazing, and selective harvesting. Slash pine needs to be planted in areas favorable to natural reseeding. Under good management, yields are greatly increased.

The soils of this unit provide suitable cover and some feed for wildlife under natural conditions. Most areas of this unit are not very suitable for plants that produce feed for wildlife. Any success in such production requires good management that includes proper fertilizing and protection from fire and grazing.

Capability unit VIIs-2

This capability unit is made up of deep, droughty sands. They are coarse in texture, very porous, and extremely low in fertility. They contain little organic matter, and their available moisture capacity is very low. These soils are:

Lakewood sand, level phase.
Lakewood sand, very gently sloping phase.

These soils produce no plants except the most drought-resistant native species, and yields of forest products are very low. The natural vegetation consists principally of brush and the most drought-resistant, slow-growing trees. Management practices for these soils include retaining a vegetative cover, encouraging natural reseeding of desirable trees, and protecting the areas from fire. Barren areas are susceptible to wind erosion. A good cover of vegetation helps retard this. Plantings of adapted pines

may grow successfully in the more nearly denuded areas.

These soils have very little value for wildlife except as cover or refuge, and the native plants provide only a small amount of feed. Planting more desirable plants to produce such feed is not generally worthwhile, for the soils are so poor. To receive the most benefit from these areas the vegetation needs to be protected from fire. Most areas of these soils are being developed as residential sites.

Capability unit VIII–1

This capability unit is composed of coastal dunes and tidal marsh. The mapping units are:

Coastal dune land and beach.
Tidal marsh.

Included are barren sands and marshy areas along the coast that are affected by salt water. They produce no useful vegetation and are suitable only for recreation or as a habitat for a few species of waterfowl.

Land types not classified

Four miscellaneous land types shown on the soil map are not included in the capability grouping because they are unsuitable for farming, forestry, or pasture. Specific sites of some of these units, if suitably treated, may have some capability for crops, grazing, or woodland. In general, however, these land types have little potential for such development. They are:

Fresh water swamp.
Mixed alluvial land, poorly drained.
Mixed local alluvial land, moderately well drained.
Pits, dumps, and made land.

Estimated Yields

Estimated average acre yields for the principal crops grown in the county are listed in table 4. These estimates are based on different levels of management. In columns A are yields to be expected under the management generally practiced in the county; and in columns B are yields to be expected under improved management.

The yield estimates in columns A are based mostly on observations made by members of the soil survey party; on interviews with local farmers; on information obtained from other agricultural workers who have had experience with the soils and crops of the area; and, where available, records of crop yields. For most soils, however, records on crop yields were not available.

In columns B are expected average yields under more intensive management practices. This management includes proper choice and rotation of crops; the correct use of commercial fertilizers, lime, or other amendments; use of proper tillage methods; return of organic matter to the soils; applying mechanical means of water control to maintain productivity of the soils or to increase it within practical limits; and the conservation of soil material, plant nutrients, and moisture. The level of management needed to get the yields in columns B is about equivalent to that described for the capability units in the subsection, Capability Groups of Soils.

The estimates in columns B take into consideration the known deficiencies of the soils and the increases in crop yields that can be expected when these deficiencies are corrected within practical limits. These limits cannot be precisely defined, nor can the response to the improved management practices be precisely predicted for a given crop on a given soil. Some unknown deficiency that is not being corrected may materially affect yields.

Because good management cannot be rigidly defined, and because information is scarce about crop yields under conditions that approximate good management, the expected yields in columns B are based principally on estimates of men who have had experience with the soils and crops. Almost every soil in Escambia County will produce profitable increases in yields under more intensive, improved management.

Yields are not listed for all of the soils in the county. Most soils not listed are not used for cultivated crops. The miscellaneous land types are not listed because they are not considered suitable for crops under the systems of management specified. These land types are: Coastal dune land and beach; Fresh water swamp; Gullied land; Mixed alluvial land, poorly drained; Pits, dumps, and made land; Rough broken land; and Tidal marsh.

Forests and Forest Soils of Escambia County[4]

Forest products are an important source of income in Escambia County. Of the 420,480 acres of land in the county, 346,000 acres is classified as commercial forest. Sawmills, pressure and open-vat treating plants, a paper mill, producers of stump-wood naval stores, and a fiberboard manufacturer operate in the county. The greatest volume of cutting is for pulpwood; the remainder is primarily for poles, piling, and sawtimber.

The native forest is classified as Southeastern Pine Forest and River-Bottom Forest by Shantz and Zon (*6*). The pine forests consist mostly of longleaf pine and some slash pine. Although longleaf and slash pines often grow in mixed stands, slash pine is better suited to the somewhat poorly drained soils than the longleaf pine. Longleaf pine, in contrast, seems to tolerate the dry sandy soils much better than does slash pine. On soils between these two extremes, both species are about equally well suited (*5*). Longleaf pine predominates, primarily because forest fires have helped to control brown-spot needle diseases and to eliminate competing species that have much less fire resistance.

The river-bottom forests consist of red gum, tupelo gum, and black gum, cypress, bay, water oak, and associated species.

Forest Types

The forest types may be roughly divided as: (a) Cypress-gum, (b) slash pine-gum-oak, (c) longleaf pine, and (d) longleaf pine-scrub oak. Throughout the county, the boundaries of these groups coincide roughly with boundaries of groups of associated soils.

The Cypress-Gum Group consists of a mixed forest that varies with the amount of standing water on the soil or the nearness of the water table to the surface. Cypress and tupelo gum occupy the sloughs and areas

[4] Prepared in cooperation with the Florida Forest Service.

TABLE 4.—*Estimated average acre yields of principal crops grown in Escambia County, Florida*

[Yields in columns A are those to be expected under common management practices; those in columns B, under good management practices. Absence of yield indicates crop is not commonly grown and soil is not physically suitable for it under the management specified]

Soil type	Corn		Cotton		Soybeans		Oats	
	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bales*	*Bales*	*Bu.*	*Bu.*	*Bu.*	*Bu.*
Angie fine sandy loam, very gently sloping phase	25	40			15	20	25	50
Barth loamy fine sand	10	15					15	20
Blakely loam	35	50	¾	1½	20	25	35	60
Carnegie fine sandy loam, level phase	35	50	¾	1½	20	25	35	60
Carnegie fine sandy loam, very gently sloping phase	35	50	¾	1½	20	25	35	60
Carnegie fine sandy loam, eroded very gently sloping phase	30	45	½	¾	15	20	30	55
Carnegie fine sandy loam, gently sloping phase	30	45	½	¾	15	20	30	55
Carnegie fine sandy loam, eroded gently sloping phase	25	40	⅜	⅝	12	18	25	50
Eustis loamy fine sand, level phase	10	15					15	20
Eustis loamy fine sand, very gently sloping phase	10	15					15	20
Eustis loamy fine sand, gently sloping phase	8	12					10	15
Eustis loamy sand, level phase	10	15					15	20
Eustis loamy sand, very gently sloping phase	10	15					15	20
Eustis loamy sand, gently sloping phase	8	12					10	15
Faceville fine sandy loam, level phase	35	50	¾	1½	15	25	35	60
Faceville fine sandy loam, very gently sloping phase	35	50	¾	1½	15	25	35	60
Grady loam [1]	20	30			10	15		
Irvington fine sandy loam [1]	35	60			15	25		
Izagora fine sandy loam	30	50	¾	1½	15	25	30	50
Kalmia fine sandy loam, level phase	30	50	¾	1½	15	25	30	50
Kalmia fine sandy loam, very gently sloping phase	30	50	¾	1½	15	25	30	50
Klej loamy sand, level phase	10	15					15	20
Klej loamy sand, very gently sloping phase	10	15					15	20
Lakeland loamy fine sand, level phase	10	15					15	20
Lakeland loamy fine sand, very gently sloping phase	10	15					15	20
Lakeland loamy sand, level phase	8	12					10	15
Lakeland loamy sand, very gently sloping phase	8	12					10	15
Lynchburg fine sandy loam, level phase	25	50			20	25	30	45
Lynchburg fine sandy loam, very gently sloping phase	25	50			20	25	30	45
Lynchburg gravelly very fine sandy loam	25	50			20	25	30	45
Mixed local alluvial land, moderately well drained	20	25						
Myatt loamy fine sand, thick surface phase [1]	15	20						
Myatt very fine sandy loam, level phase [1]	15	20						
Myatt very fine sandy loam, very gently sloping phase [1]	15	20						
Norfolk fine sandy loam, level phase	40	55	¾	1½	25	30	35	60
Norfolk fine sandy loam, very gently sloping phase	40	55	¾	1½	25	30	35	60
Norfolk fine sandy loam, gently sloping phase	35	50	½	1	20	25	35	60
Red Bay fine sandy loam, level phase	35	50	¾	1½	20	25	35	60
Red Bay fine sandy loam, very gently sloping phase	35	50	¾	1½	20	25	35	60
Red Bay fine sandy loam, gently sloping phase	25	40	½	¾	15	20	35	60
Red Bay loamy fine sand, level thick surface phase	25	35	¼	½	15	20	25	45
Red Bay loamy fine sand, very gently sloping thick surface phase	25	35	¼	½	15	20	25	45
Ruston fine sandy loam, level phase	35	50	¾	1¼	20	25	35	60
Ruston fine sandy loam, very gently sloping phase	35	50	¾	1¼	20	25	35	60
Ruston fine sandy loam, gently sloping phase	25	40	½	¾	15	20	35	60
Ruston loamy fine sand, level thick surface phase	25	35	¼	½	15	20	25	45
Ruston loamy fine sand, very gently sloping thick surface phase	25	35	¼	½	15	20	25	45
Savannah fine sandy loam, level thick solum phase	40	55	¾	1½	25	30	35	60
Savannah fine sandy loam, very gently sloping thick solum phase	40	55	¾	1½	25	30	35	60
Stough fine sandy loam	25	50			20	25	30	45
Tifton fine sandy loam, level phase	40	55	¾	1½	25	30	35	60
Tifton fine sandy loam, very gently sloping phase	40	55	¾	1½	25	30	35	60
Tifton fine sandy loam, gently sloping phase	35	50	½	¾	20	25	35	60

[1] Drainage is required to obtain estimated yields.

that are under water most of the time. The overflow areas are commonly stocked with a mixture of cypress, red gum, tupelo gum, black gum, bay, water oak, and associated species.

Cypress was an important product of the swamp forest, but it was overcut severely during early logging. Only defective and low-grade trees are left. Cypress does not reseed easily, and it grows slowly. Second-growth timber of desirable quality, therefore, makes little progress. To some extent, gum and poplar are cut for saw logs. Poplar, bay, and willow are used to some extent for pulpwood.

Reseeding in flood areas is difficult. The soil must be above water long enough for seedlings to become estab-

lished and grow tall enough to have leaves and buds above high water that remains for several days. Much of the restocking in such areas is accomplished through root sprouting, but often the trees that come up from the roots are not desirable species.

The soils of the bottom lands are not classified by soil series because the areas are too difficult to reach and the soils occur in too intricate a pattern to be described separately.

THE SLASH PINE-POPLAR-OAK GROUP consists of a mixed stand of slash pine, tulip-poplar, gum, live oak, white oak, chinquapin oak, bay, and magnolia. This group occurs adjacent to moist areas and on slopes above the flood level where the water table is near the surface or where seepage water is sufficient for these trees. Slash pine is in this group partly because it is well suited to moist sites, and also because fires have occurred less frequently in these moist locations.

Soils with a dark-gray surface soil and yellow subsoil predominate in areas where this forest group occurs. Some of them have mottlings in the subsoil that indicate somewhat restricted drainage. The Izagora, Wahee, and Stough soils are on the stream terraces; the Lynchburg soils occur on the level to very gently sloping uplands.

THE LONGLEAF PINE GROUP consists of pure stands of second-growth longleaf pine; stands of mixed longleaf and slash pines; and stands of longleaf pine and some hardwoods, primarily of the red oak and white oak groups. Although slash pine is scarce, it is well suited to the soils where these trees grow.

This forest group grows in the dominantly deep and well-drained Norfolk, Tifton, Carnegie, Faceville, and Red Bay soils.

THE LONGLEAF-SCRUB OAK GROUP consists of longleaf pine and a severe invasion of scrub oak (turkey, blackjack, bluejack, and post); stands of longleaf pine and a moderate invasion of scrub oak; and stands of almost all scrub oak. Most of the pine-scrub oak forests are overcut. Natural restocking of pine is prevented by a lack of seed trees, too many and ill-timed fires, poor site, competition of wiregrass, and severe competition of scrub oak. Some restocking of longleaf pine, however, will develop where seed trees are present and the land is protected from fire. But this type of seeding is exceedingly slow.

Studies being cooperatively financed by the United States Forest Service and the Florida Forest Service indicate that almost complete elimination of root competition is necessary for satisfactory survival of pine seedlings planted in the dry sandy soils of West Florida (*9*).

In this forest group are deep, acid, droughty sands and loamy sands of the Lakeland, Eustis, and related soils. Trees grow more slowly on these soils than on those that contain more moisture.

Forest Management

Proper management is essential for maximum production of high-quality forest products. It increases the returns from good forest soils and brings a profit from soils that otherwise might be almost worthless. To produce a maximum of quality timber, stands need to be fully stocked with the right species.

Soils affect forests much the same as soils affect any other crop. But crops grow and mature within a few weeks, and trees absorb nutrients slowly over an entire season. This means that plant nutrients too slowly available to be adequate for other crops are sufficient for trees. Also, minerals absorbed from the soil by the forests are normally replaced in the yearly leaf fall.

Nature normally perpetuates the forests. Good profitable growth, however, develops when man protects them from fire and grazing and thins them suitably at proper intervals. This increased growth actually allows the forest to replace the volume thinned out. Natural seeding has restocked large acreages with longleaf pine where sufficient seed trees were left from previous cutting. Generally adequate is 7 to 10 good seed trees per acre, well distributed. Longleaf pine makes little growth in height until it reaches an inch or more in diameter at the ground level.

A potential forest soil needs to be planted if it is not restocking adequately with desirable species of trees or is not restocking in a reasonable length of time. The forest plantings in recent years have been mostly slash pine (fig. 9). This pine is easy to produce in the nursery, easy to plant, survives well, and grows rapidly. In production of lumber, turpentine, and pulpwood it compares with longleaf, but it is more susceptible to fire, insects, and diseases.

***Figure 9.*—Seven-year-old planting of slash pine on Tifton fine sandy loam.**

Soil that has been in cultivation generally needs no special preparation for planting. Recently cutover forest soil often may be used without preparation other than to control the burning of accumulated grass, weeds, and brush. In addition to making the planting easier, loosening the soil will generally improve the height of seedlings.

A study of planted slash pine in several locations throughout Florida shows that in every place where slash pine was planted in fields that were abandoned after cultivation, it responded with considerably more growth than pine planted on comparable virgin soil. Fields abandoned after cultivation offer almost no root competition. They generally contain some residual sup-

ply of plant nutrients and are in a much better physical condition for plant growth than virgin soils.

A study of the effects of limited ground preparation is being carried on in Calhoun County by the Florida Forest Service in cooperation with the International Paper Company. In the limited cultivation practiced, slash pine was planted in cutover soil that was prepared through use of an Athens harrow pulled behind a tractor. One trip was made for each strip. The strips were 10 feet between centers. Trees were planted at 6-foot intervals, in the center of these prepared strips. They were also planted on an unprepared check plot.

There has been no significant difference in survival of planted trees on the prepared strips and those on the check plot. After 4½ years, trees on the prepared plot showed 70 percent greater height than on the unprepared check plot, and at 7 years they showed 39 percent greater height. A comparison of the plots 12 years after planting indicates little difference in total height growth.

The owner who plants trees or desires to practice management on forest land will likely encounter many problems on which he may need the advice of a professional forester. Each site presents its own special set of conditions and problems, many of which require decisions on a technical basis. Technical assistance may be obtained from the County Forester, through the County Agent, or through the local representative of the Soil Conservation Service.

Engineering Applications [5]

This soil survey report for Escambia County contains information that engineers can use to:

1. Make soil and land-use studies that will aid in the selection and development of industrial, business, residential, and recreational sites.
2. Estimate runoff and erosion characteristics for use in designing drainage and irrigation structures and in planning dams and other structures for water and soil conservation.
3. Make reconnaissance surveys of soil and ground conditions that will aid in selecting highway and airport locations and in planning detailed soil studies for the intended locations.
4. Locate sand and gravel for use in structures.
5. Determine the suitability of soils for cross-country movements of vehicles and construction equipment.
6. Supplement information obtained from other published maps and reports and aerial photographs, for the purpose of making soil maps and reports that can be readily used by engineers.

The mapping and the descriptive report are somewhat generalized and should be used only in planning more detailed field surveys to determine the in-place condition of the soil at the site of the proposed engineering construction.

[5] This section was prepared by P. C. SMITH, supervisory highway research engineer, Division of Physical Research, Bureau of Public Roads, with assistance of personnel of the Soil Conservation Service, Florida Agricultural Experiment Stations, and Florida State Road Department. Test data in table 5 were obtained in the Soils Laboratory, Bureau of Public Roads.

Some terms used by the agricultural soil scientist may be unfamiliar to the engineer, and some words, for example, soil, clay, silt, sand, and aggregate, may have special meanings in soil science. These terms, as well as other special terms used in soil survey reports, are defined in the glossary.

Soil Engineering Tests and Classifications

To make the best use of the soil map and the soil survey report, the engineer needs to know the physical properties of the soil materials and the in-place condition of the soils. In this section several tables summarize the physical properties of the soils that affect their use in engineering structures and foundations. This information will aid the engineer in preliminary planning but is not intended as a substitute for the engineering tests that will need to be made at the site selected for construction.

Table 5 records data on samples from nine extensive soil types tested in accordance with standard procedures (*1*). The data in this table were used in evaluating the soils of the county for engineering purposes. At some sites the samples were obtained from depths of less than 5 feet; therefore, the test data may not be representative for materials that will be found in the substrata in deep excavations.

Table 6 shows the characteristics of the soils that are considered in classifying them by the A.A.S.H.O. system (*1*), and table 7, those properties taken into account in classifying soils by the Unified system (*10*). These two tables are intended primarily for those not familiar with these systems of classification.

Table 8 summarizes the primary engineering features of the soils—their slope, natural drainage, depth to water table, and kinds of materials in the various layers. Table 9 is considerably more detailed. It lists selected soils, and for each layer in typical profiles of those soils it gives depth, permeability, structure, moisture capacity, pH, shrink-swell potential, and suitability as a source of material for topsoil material for topdressing roadbanks. In this table the depths for the profile are essentially the same as those given for the typical profile in the section, Soil Descriptions. They are not always identical, however, for the depths given in table 9 indicate changes in soil material that are significant in engineering. Hence, in table 9, adjacent soil layers having essentially the same engineering properties have been shown as one layer. In evaluating the data in table 9, it should be remembered that the depths of the layers will vary for each soil listed in the table, and that depths of layers in other soils of the same kind will also vary. For example, table 9 lists typical depths for Eustis loamy sand, level phase. Depths vary in this soil, and they vary in the other Eustis loamy sands mapped.

The estimated permeability of the soils listed in table 9 is for the soil in its natural condition. The estimates are based mostly on examination of soil texture and structure, but other properties of the soil may influence permeability. Permeability of each soil layer is important in planning the drainage for a farm and in other construction work. Layers that impede drainage or that are too permeable, in comparison with adjacent layers, may

greatly affect the suitability of a soil for engineering purposes.

Also to be considered in planning are soil structure, consistence, and content of organic matter, which affect the moisture-holding capacity of the soils.

Clayey materials—those having a high shrink-swell potential—have low stability when wet, but they can be used for cores of dams or dikes. Materials that have a low shrink-swell potential, such as the loamy sand of the Eustis soils, are preferred for a road subgrade or a foundation for a pavement.

In table 10 are summarized features of the soils that affect their use in highway work and in soil conservation work. The soils are of variable suitability for use in road subgrades and embankments of various kinds. Their suitability is rated on the assumption that the material is at proper moisture content for suitable compaction. On some soils, this means that drainage ditches will be needed, and that moisture content will be controlled by adding or extracting water, before the material will be used in subgrades or embankments.

Highly organic material in poorly drained, depressed areas is not suitable for road construction. It should be removed from the roadway section and placed where it will not be detrimental. It can be mixed with other soil materials to improve fertility and then be used as a top-dressing on cut or fill slopes and in ditches.

Many soils have a shallow water table or are ponded for significant parts of each year. Roads on these soils need to be built on embankments or provided with an adequate system of surface drains and underdrains. Such drains may be needed where roads are to be built on soils that have layers of clay interbedded with very permeable layers. In lowlands and other areas that are flooded, roads need to be built on a continuous embankment several feet above flood level.

Part of table 10 concerns soil conservation work—construction of dikes, farm ponds, drainage, and irrigation. The information given is based on interpretation of the characteristics and properties of the soils given in tables 8 and 9 and takes into account experience with soils in the county or with similar soils in other areas.

At the site selected for construction, there may be major variations in a soil within the depth proposed for excavation, and several soils may be encountered within a short distance. Therefore, in planning, the engineering data given in this section should be supplemented by study of other parts of the soil report, particularly the section, Soil Descriptions, and by investigating the soil materials and soil conditions at the site selected for construction. Nevertheless, by using this report, the soils engineer can eliminate considerable preliminary investigation.

Genesis, Morphology, and Classification of Soils

Soil is the product of the forces of soil development acting on parent material deposited or accumulated through geologic agencies. These forces are (1) the climate under which the soil material has accumulated and has since existed; (2) the physical and mineralogical composition of the parent material; (3) the plant and animal life in and on the soil; (4) the relief or lay of the land; and (5) the length of time the four forces already mentioned have acted on the soil material.

The interaction of climate and vegetation change the parent material from an inert, heterogeneous mass into a body having more or less definite genetic morphology. The action of these factors on the parent material is accelerated or retarded in a varying degree by the relief, which determines to some extent surface runoff, the movement of water through the soil, natural erosion, and the natural vegetation. The character of the parent material itself also influences climate and vegetation in soil formation and is important in determining the temperature and moisture conditions within the soil and the kinds of natural vegetation.

Throughout the genesis of soil, time brings about changes; hence, age is a factor in the development of the soil into a body in equilibrium with its environment. The degree of profile development is the product of the action of climate, living organisms, and vegetation, as conditioned by relief and time. In the following pages the factors of soil formation and their effects on soil development in Escambia County are discussed.

Factors of Soil Formation

Climate

The climate of Escambia County gives rise to Red-Yellow Podzolic and Reddish-Brown Lateritic soils. The average annual temperature is 68° F.; and the average annual rainfall is 61.6 inches. The winters are mild, with only few short cold periods. The soils are occasionally frozen to a very shallow depth for brief periods.

The climate is such that biological activity, leaching, and translocation of insoluble material are active throughout the year. This is one of the reasons that the soils of the county contain little of organic matter and soluble plant nutrients. Leaching has prevented the accumulation of free carbonate of lime in any of the soils. The climate is fairly constant throughout the county and, therefore, has not been a major factor in producing differences among the soils.

Parent material

The parent material of the soils of Escambia County consists of (a) marine deposits, and (b) stream deposits. Sand and gravel formations of the Pleistocene series cover most of the county. Under these are sand, gravel, and clay of the Citronelle formation, which belongs to the Pliocene series. The Citronelle formation is exposed at varying heights in the bluffs along the rivers and bays as far south as Pensacola.

The Pleistocene sands and gravels are in a series of marine-terrace plains. The various terraces record oscillation of sea level and are best defined by reference to the present altitudes of their respective shorelines. According to Cooke (*3*) there are seven established terraces, with shorelines at altitudes as follows:

Terrace:	*Feet*
Brandywine	270
Coharie	215
Sunderland	170
Wicomico	100
Penholoway	70
Talbot	42
Pamlico	25

TABLE 5.—*Engineering test data* [1] *for*

Soil name and location	Parent material	Bureau of Public Roads report No.	Depth	Horizon	Moisture-density		Mechanical			
					Maximum dry density	Optimum moisture	Percentage			
							2-in.	1½-in.	1-in.	¾-in.
			Inches		*Lb. per cu. ft.*	*Percent*				
Carnegie fine sandy loam: SW¼NE¼ sec. 27, T. 1 N., R. 31 W.	Stratified, unconsolidated, acid sandy clay loams and sandy clays.	89872	0 to 7	A_p	116	12	100	93	93	90
		89873	11 to 29	B_2	112	18	------	100	96	96
		89874	29+	C	104	20	------	------	------	------
Eustis loamy sand: SW¼NW¼ sec. 33, T. 1 S., R. 30 W.	Stratified, unconsolidated, acid sandy loams and sands.	89860	0 to 6	A	118	12	------	------	------	------
		89861	12 to 23	B	124	10	------	------	------	------
		89862	30 to 46	C	127	10	------	------	------	------
Faceville fine sandy loam: SW¼SE¼ sec. 5, T. 5 N., R. 32 W.	Stratified, unconsolidated, acid sandy clay loams and sandy clays.	89878	0 to 6	A_p	111	14	------	------	------	------
		89879	12 to 28	B_2	121	13	------	------	------	------
		89880	40+	C	111	17	------	------	------	------
Kalmia fine sandy loam: NE¼SW¼ sec. 4, T. 5 N., R. 30 W.	Stratified, unconsolidated, acid sandy clay loams and loamy sands.	89856	0 to 6	A_p	113	12	------	------	------	------
		89857	6 to 12	A_2	118	13	------	------	------	------
		89858	44 to 48	C	119	10	------	------	------	------
		89859	48+	D	114	12	------	------	------	100
Lynchburg fine sandy loam: NW¼SW¼ sec. 16, T. 1 N., R. 31 W.	Stratified, unconsolidated, acid sandy clay loams and sandy loams.	89875	0 to 7	A	112	15	------	------	------	------
		89876	10 to 16	B_2	123	11	------	------	------	------
		89877	27+	C	122	12	------	------	------	100
Norfolk fine sandy loam: NE¼SW¼ sec. 13, T. 1 N., R. 30 W.	Stratified, unconsolidated, acid sandy clay loams and sandy loams.	89869	0 to 6	A_p	116	12	------	------	------	100
		89870	20 to 48	B_2	121	12	------	------	------	------
		89871	48 to 66	C_1	91	24	------	------	------	------
Red Bay fine sandy loam: NE¼NE¼ sec. 12, T. 5 N., R. 33 W.	Stratified, unconsolidated, acid sandy clay loams and sandy loams.	89850	0 to 10	A_p and A_2.	120	10	------	------	------	------
		89851	10 to 60	B	113	16	------	------	------	------
		89852	60+	C_1	115	15	------	------	------	------
NE¼SW¼ sec. 13, T. 1 N., R. 30 W.	Stratified, unconsolidated, acid sandy clay loams and sandy loams.	89866	0 to 6	A_p	118	11	------	------	------	------
		89867	15 to 144	B_2	119	13	------	------	------	------
		89868	144 to 152	B_3	117	14	------	------	------	------
Ruston fine sandy loam: NE¼NW¼ sec. 29, T. 5 N., R. 32 W.	Stratified, unconsolidated, acid sandy clay loams and sandy loams.	89853	0 to 6	A_1	115	12	------	------	------	------
		89854	18 to 42	B_2 and B_3	117	13	------	------	------	------
		89855	42+	C_1	112	16	------	------	------	------
Tifton fine sandy loam: SE¼NE¼ sec. 17, T. 1 N., R. 31 W.	Stratified, unconsolidated, acid sandy clay loams and sandy clays.	89863	0 to 6	A_p	117	11	------	------	100	99
		89864	25 to 34	B_2	120	12	------	------	100	99
		89865	58 to 64+	C	109	18	------	------	------	------

[1] Tests performed by the Bureau of Public Roads in accordance with standard procedures of the American Association of State Highway Officials (A. A. S. H. O.).

[2] Mechanical analyses according to the American Association of State Highway Officials Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the A. A. S. H. O. procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 mm. in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette

soil samples taken from 9 soil types

analysis [2]													
passing sieve						Percentage smaller than				Liquid limit	Plasticity index	Classification	
⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			A. A. S. H. O. [3]	Unified [4]
85	78	75	71	65	31	24	11	8	4	18	2	A–2–4(0)	SM
94	90	89	86	82	55	52	44	37	34	37	14	A–6(6)	ML–CL
------	------	100	96	86	56	52	44	40	36	45	17	A–7–6(8)	ML–CL
------	------	100	74	44	21	19	14	8	6	NP [5]	NP [5]	A–2–4(0)	SM
------	------	100	78	49	21	20	16	10	8	NP [5]	NP [5]	A–2–4(0)	SM
------	------	100	79	50	23	23	19	12	8	NP [5]	NP [5]	A–2–4(0)	SM
------	------	100	95	86	58	53	40	22	17	25	7	A–4(5)	ML–CL
------	------	100	94	86	57	55	42	30	26	30	12	A–6(5)	CL
------	------	100	96	89	62	58	48	39	36	37	13	A–6(7)	ML–CL
------	------	100	93	88	57	44	20	10	7	NP [5]	NP [5]	A–4(4)	ML
------	------	100	97	94	64	51	28	21	19	26	7	A–4(6)	ML–CL
------	------	100	92	85	49	36	18	12	9	NP [5]	NP [5]	A–4(3)	SM
94	81	69	37	16	6	5	4	3	3	NP [5]	NP [5]	A–1–b(0)	SP–SM
------	------	100	99	88	40	37	27	18	13	24	6	A–4(1)	SM–SC
------	------	100	97	83	35	32	24	17	14	19	5	A–2–4(0)	SM–SC
99	96	91	83	72	35	33	25	18	15	23	7	A–2–4(0)	SM–SC
99	99	99	95	85	34	29	18	10	8	NP [5]	NP [5]	A–2–4(0)	SM
100	99	98	95	88	48	44	32	25	22	26	10	A–4(3)	SC
------	------	100	97	92	65	63	57	48	45	54	19	A–7–5(12)	MH
------	------	100	96	84	51	45	30	17	12	19	4	A–4(3)	ML–CL
------	------	100	97	87	61	58	47	38	36	40	15	A–6(7)	ML–CL
------	------	100	97	85	54	50	39	32	31	36	14	A–6(5)	CL
------	------	100	97	87	34	31	22	14	11	16	2	A–2–4(0)	SM
------	------	100	98	92	47	45	39	34	31	28	12	A–6(3)	SC
------	------	100	98	92	42	39	33	31	29	27	10	A–4(1)	SC
------	------	100	95	83	45	38	25	16	11	20	4	A–4(2)	SM–SC
------	------	100	96	88	56	51	39	30	27	31	12	A–6(5)	CL
------	------	100	97	88	54	50	40	34	31	36	13	A–6(5)	ML–CL
97	95	95	92	84	37	29	14	8	7	NP [5]	NP [5]	A–4(0)	SM
97	93	92	89	84	45	40	29	23	20	23	7	A–4(2)	SM–SC
100	99	98	95	89	51	48	40	33	31	39	16	A–6(5)	CL

method, and the material coarser than 2 mm. in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soils.

[3] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (pt. 1 ed. 7): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, A. A. S. H. O. Designation M 145–49.

[4] Based on the Unified Soil Classification System, Tech. Memo. No. 3–357 v. 1, Waterways Experiment Station, Corps of Engineers, Mar. 1953.

[5] NP=Nonplastic.

TABLE 6.—*Classification of soils by American*

General classification	Granular materials (35 percent or less passing No. 200 sieve).				
Group classification	A–1		A–3	A–2	
	A–1–a	A–1–b		A–2–4	A–2–5
Sieve analysis:					
Percent passing—					
No. 10	50 maximum				
No. 40	30 maximum	50 maximum	51 minimum		
No. 200	15 maximum	25 maximum	10 maximum	35 maximum	35 maximum
Characteristics of fraction passing No. 40 sieve:					
Liquid limit			NP[2]	40 maximum	41 minimum
Plasticity index	6 maximum	6 maximum	NP[2]	10 maximum	10 maximum
Group index	0	0	0	0	0
Usual types of significant constituent materials.	Stone fragments, gravel, and sand.	Stone fragments, gravel, and sand.	Fine sand	Silty gravel and sand.	Silty gravel and sand.
General rating as subgrade	Excellent to good.				

[1] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (pt. 1; ed. 7): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, A. A. S. H. O. Designation: M 145–49.

Association of State Highway Officials [1]

Granular materials (35 percent or less passing No. 200 sieve)—Continued		Silt-clay materials (More than 35 percent passing No. 200 sieve)				
A–2—Continued		A–4	A–5	A–6	A–7	
A–2–6	A–2–7				A–7–5	A–7–6
35 maximum	35 maximum	36 minimum	36 minimum	36 minimum	36 minimum	36 minimum.
40 maximum 11 minimum 4 maximum Clayey gravel and sand.	41 minimum 11 minimum 4 maximum Clayey gravel and sand.	40 maximum 10 maximum 8 maximum Nonplastic to moderately plastic silty soils.	41 minimum 10 maximum 12 maximum Highly elastic silts.	40 maximum 11 minimum 16 maximum Medium plastic clays.	41 minimum 11 minimum[3] 20 maximum Highly plastic clays.	41 minimum. 11 minimum[3]. 20 maximum. Highly plastic clays.
Fair to poor.						

[2] NP=nonplastic.
[3] Plasticity index of A–7–5 subgroup is equal to or less than LL minus 30. Plasticity index of A–7–6 subgroup is greater than LL minus 30.

TABLE 7.—*Characteristics of soil groups*

Major divisions	Group symbol	Soil description	Value as foundation material [2]	Value as base course directly under bituminous pavement
Coarse-grained soils (*more than half of material is larger than No. 200 sieve size*):				
Gravels and gravelly soils (*more than half of coarse fraction retained on No. 4 sieve*).	GW	Well-graded gravels and gravel-sand mixtures, little or no fines.	Excellent	Good
	GP	Poorly graded gravels or gravel-sand mixtures; little or no fines.	Good to excellent	Poor to fair
	GM	Silty gravels, gravel-sand-silt mixtures.	Good	Poor to good
	GC	Clayey gravels, gravel-sand-clay mixtures.	Good	Poor
Sands and sandy soils (*more than half of coarse fraction passing No. 4 sieve*).	SW	Well-graded sands and gravelly sands, little or no fines.	Good	Poor
	SP	Poorly graded sands or gravelly sands, little or no fines.	Fair to good	Poor to not suitable.
	SM	Silty sands, sand-silt mixtures	Fair to good	Poor to not suitable.
	SC	Clayey sands, sand-clay mixtures.	Fair to good	Not suitable
Fine-grained soils (*more than half of material is smaller than No. 200 sieve size*):				
Silts and clays (*liquid limit is less than 50*)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts of slight plasticity.	Fair to poor	Not suitable
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Fair to poor	Not suitable
	OL	Organic silts and organic silty clays having low plasticity.	Poor	Not suitable
Silts and clays (*liquid limit greater than 50*)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Poor	Not suitable
	CH	Inorganic clays having high plasticity, fat clays.	Poor to very poor	Not suitable
	OH	Organic clays having medium to high plasticity, organic silts.	Poor to very poor	Not suitable
Highly organic soil	Pt	Peat and other highly organic soils.	Not suitable	Not suitable

[1] Based on information in The Unified Soil Classification System, Technical Memorandum No. 3-357, Volumes 1, 2, and 3. Waterways Experiment Station, Corps of Engineers, 1953. Ratings and ranges in test values are for guidance only. Design should be based on field survey and test of samples from construction site.

in Unified soil classification system [1]

Value for embankments	Compaction: Characteristics and recommended equipment	Approximate range in A.A.S.H.O. maximum dry density [3]	Field (in-place) CBR	Subgrade modulus, k	Drainage characteristics	Comparable groups in A. A. S. H. O. classification
		Lb./cu. ft.		*Lb./sq. in./in.*		
Very stable; use in pervious shells of dikes and dams.	Good; use crawler-type tractor, pneumatic-tire roller, or steel-wheel roller.	125–135	60–80	300+	Excellent	A–1.
Reasonably stable; use in pervious shells of dikes and dams.	Good; use crawler-type tractor, pneumatic-tire roller, or steel-wheel roller.	115–125	25–60	300+	Excellent	A–1.
Reasonably stable; not particularly suitable for shells but may be used for impervious cores or blankets.	Good; but needs close control of moisture; use pneumatic-tire or sheepsfoot roller.	120–135	20–80	200–300+	Fair to practically impervious.	A–1 or A–2.
Fairly stable; may be used for impervious core.	Fair; use pneumatic-tire or sheepsfoot roller.	115–130	20–40	200–300	Poor to practically impervious.	A–2.
Very stable; may be used in pervious sections; slope protection required.	Good; use crawler-type tractor or pneumatic-tire roller.	110–130	20–40	200–300	Excellent	A–1.
Reasonably stable; may be used in dike section having "flat" slopes.	Good; use crawler-type tractor or pneumatic-tire roller.	100–120	10–25	200–300	Excellent	A–1 or A–3.
Fairly stable; not particularly suitable for shells but may be used for impervious cores or dikes.	Good; needs close control of moisture; use pneumatic-tire or sheepsfoot roller.	110–125	10–40	200–300	Fair to practically impervious.	A–1, A–2, or A–4.
Fairly stable; use as impervious core for flood-control structures.	Fair; use pneumatic-tire roller or sheepsfoot roller.	105–125	10–20	200–300	Poor to practically impervious.	A–2, A–4, or A–6.
Poor stability; may be used for embankments if properly controlled.	Good to poor; close control of moisture is essential; use pneumatic-tire or sheepsfoot roller.	95–120	5–15	100–200	Fair to poor	A–4, A–5, or A–6.
Stable; use in impervious cores and blankets.	Fair to good; use pneumatic-tire or sheepsfoot roller.	95–120	5–15	100–200	Practically impervious.	A–4, A–6, or A–7.
Not suitable for embankments.	Fair to poor; use sheepsfoot roller.[4]	80–100	4–8	100–200	Poor	A–4, A–5, A–6, or A–7.
Poor stability; use in core of hydraulic fill dam; not desirable in rolled fill construction.	Poor to very poor; use sheepsfoot roller.[4]	70–95	4–8	100–200	Fair to poor	A–5 or A–7.
Fair stability on "flat" slopes; use in thin cores, blankets, and dike sections of dams.	Fair to poor; use sheepsfoot roller.[4]	75–105	3–5	50–100	Practically impervious.	A–7.
Not suitable for embankments.	Poor to very poor; use sheepsfoot roller.[4]	65–100	3–5	50–100	Practically impervious.	A–5 or A–7.
Not used in embankments, dams, or subgrades for pavement					Fair to poor	None.

[2] Ratings are for subgrade and subbases for flexible pavement.
[3] Determined in accordance with test designation: T 99–49, A. A. S. H. O.
[4] Pneumatic-tire rollers may be advisable, particularly when moisture content is higher than optimum.

TABLE 8.—*Principal characteristics of soils significant to engineering*

Map symbol	Soil	Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit
		Percent		*Feet*	
Aa	Angie fine sandy loam, very gently sloping phase.	2–5	Good	10+	½ to 2 feet of fine sandy loam (SM; A–2 or A–4) over strata consisting mainly of fine sandy clay loam (ML or CL; A–6 or A–7); some substrata may consist of plastic sandy clay or clay (CH; A–7). Occurs in uplands.
Ba	Barth loamy fine sand	0–2	Somewhat poor	1–2	2½ to 3½ feet of loamy sand (mainly SM; A–2) over strata of loamy sand or sand (SM or SP; A–2 or A–3); some substrata may be finer grained (SC or ML; A–4). Occurs on terraces along the Perdido and Escambia Rivers.
Bb	Blakely loam	0–1	Good	10+	1 to 1½ feet of loam (ML; A–4) on strata of fine sandy clay loam or sandy clay (SC or CL; A–4 or A–6). Occurs in slight depressions in the uplands.
Ca	Carnegie fine sandy loam, level phase.	0–2	Good	10+	1 to 2 feet of fine sandy loam (mainly SM; A–2) on strata of fine sandy clay loam or sandy clay (ML or CL; A–6 or A–7). Small iron concretions occur throughout the upper few feet of the soils and comprise up to 25 percent of soil mass at depths of 6 to 18 inches. Soils are on uplands.
Cb	Carnegie fine sandy loam, very gently sloping phase.	2–5	Good	10+	
Cc	Carnegie fine sandy loam, eroded very gently sloping phase.	2–5	Good	10+	
Cd	Carnegie fine sandy loam, gently sloping phase.	5–8	Good	10+	
Ce	Carnegie fine sandy loam, eroded gently sloping phase.	5–8	Good	10+	
Cf	Coastal dune land and beach	[1] 0–8 [2] 0–3	Excessive [1] Excessive [2]	[1] 0–10+ [2] 0–2	Wave and wind (dune) deposits along bays, lagoons, and gulf. Consist primarily of loose sand (SP; A–3). In some areas small depressions contain ponded water for several months each year and may have a thin accumulation of organic matter.
Ea	Eustis loamy fine sand, level phase	0–2	Somewhat excessive	10+	3½ to 6 feet of loamy fine sand to sand (SM or SP; A–2 or A–3) over strata of finer grained soil materials (ML or SC; A–4 or A–6), in upland. In some areas, the finer textured materials occur at depths of 2½ to 3 feet or the coarse textured material may continue to depths of more than 6 feet.
Eb	Eustis loamy fine sand, very gently sloping phase.	2–5	Somewhat excessive	10+	
Ec	Eustis loamy fine sand, gently sloping phase.	5–8	Somewhat excessive	10+	
Ed	Eustis loamy fine sand, sloping phase.	8–12	Somewhat excessive	10+	
Ee	Eustis loamy sand, level phase	0–2	Somewhat excessive	10+	
Ef	Eustis loamy sand, very gently sloping phase.	2–5	Somewhat excessive	10+	
Eg	Eustis loamy sand, gently sloping phase.	5–8	Somewhat excessive	10+	
Eh	Eustis loamy sand, sloping phase	8–12	Somewhat excessive	10+	
Ek	Eustis sand, level phase	0–2	Somewhat excessive	10+	
Em	Eustis sand, very gently sloping phase.	2–5	Somewhat excessive	10+	
En	Eustis sand, sloping phase	8–12	Somewhat excessive	10+	
Fa	Faceville fine sandy loam, level phase.	0–2	Good	10+	½ to 1½ feet of fine sandy loam and loamy fine sand (ML or CL; A–4) over strata of sandy clay loam and sandy clay (mainly SC, ML or CL; A–6). Soils are on uplands.
Fb	Faceville fine sandy loam, very gently sloping phase.	2–5	Good	10+	
Fc	Fresh water swamp	0–1	Very poor	0	Stratified materials ranging from sand to clay (SM or SP to CH; A–2 to A–7). Some areas underlain by few inches of organic matter. Covered with water or saturated for long periods; wooded.
Ga	Grady loam	0–2	Poor	0	½ to 1½ feet of loam to silty clay loam (ML to CL; A–4 or A–6) over strata of sandy clay and clay (mainly CH; A–7). Occurs in depressions on uplands.

See footnotes at end of table.

TABLE 8.—*Principal characteristics of soils significant to engineering*—Continued

Map symbol	Soil	Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit
		Percent		*Feet*	
Gb	Gullied land	8–30	Good	10+	Soil materials range from loamy fine sand to fine sandy clay (SM to CH; A–2 to A–7). Land surface has intricate pattern of gullies of various depths and is too rough to allow use of ordinary farm machinery.
Ha	Huckabee loamy fine sand, level phase.	0–2	Good	6+	2½ to 6 feet of loamy fine sand (SM; A–2) over strata of finer grained material (SC, ML, or CL; A–4 or A–6). Soils are along the Perdido and Escambia Rivers on terraces that are rarely overflowed.
Hb	Huckabee loamy fine sand, very gently sloping phase.	2–5	Good	6+	
Ia	Irvington fine sandy loam	0–2	Somewhat poor	1–2	½ to 1 foot of fine sandy loam (SM; A–4) on strata of sandy clay loam or sandy clay (SC to CH; A–4 to A–7). Small iron concretions in various quantities throughout the soil profile. Occurs on uplands.
Ib	Izagora fine sandy loam	0–2	Moderately good	2–3	1 to 1½ feet of fine sandy loam (SM, SC, or ML; A–2 or A–4) on strata of fine sandy clay loam or sandy clay (SC to CH; A–4 to A–7). Occurs on terraces along the Escambia River.
Ka	Kalmia fine sandy loam, level phase	0–2	Moderately good to good.	3–4	About 1 foot of fine sandy loam (SM or ML; A–4) on stratified materials that range in texture from sandy loam to sandy clay (SM to CL; A–2 to A–6). Soils are on terraces along the Escambia and Perdido Rivers.
Kb	Kalmia fine sandy loam, very gently sloping phase.	2–5	Moderately good to good.	3–4	
Kc	Klej loamy sand, level phase	0–2	Somewhat poor	1–2	Mainly loamy sand or sand (SM or SP; A–2 or A–3); in places the Klej loamy sand has finer textured material (SC or ML; A–4) below depth of 2½ feet. Soils are on uplands.
Kd	Klej loamy sand, very gently sloping phase.	2–5	Somewhat poor	1–2	
Ke	Klej sand, level phase	0–2	Somewhat poor	1–2	
Kf	Klej sand, very gently sloping phase.	2–5	Somewhat poor	1–2	
La	Lakeland loamy fine sand, level phase	0–2	Somewhat excessive	10+	3½ to 6 feet of loamy fine sand to sand (SM or SP; A–2 or A–3), overlying finer textured sediments (SC or ML; A–4 or A–6). In some areas the finer textured material is at depths of 2½ to 3 feet, or the coarse-textured material may continue to depths of more than 6 feet. Soils are on uplands.
Lb	Lakeland loamy fine sand, very gently sloping phase.	2–5	Somewhat excessive	10+	
Lc	Lakeland loamy fine sand, gently sloping phase.	5–8	Somewhat excessive	10+	
Ld	Lakeland loamy fine sand, sloping phase.	8–12	Somewhat excessive	10+	
Le	Lakeland loamy sand, level phase	0–2	Somewhat excessive	10+	
Lf	Lakeland loamy sand, very gently sloping phase.	2–5	Somewhat excessive	10+	
Lg	Lakeland loamy sand, gently sloping phase.	5–8	Somewhat excessive	10+	
Lh	Lakeland loamy sand, sloping phase.	8–12	Somewhat excessive	10+	
Lj	Lakeland sand, level phase	0–2	Somewhat excessive	10+	
Lk	Lakeland sand, very gently sloping phase.	2–5	Somewhat excessive	10+	
Ll	Lakeland sand, gently sloping phase.	5–8	Somewhat excessive	10+	
Lm	Lakeland sand, sloping phase	8–12	Somewhat excessive	10+	
Ln	Lakeland, Ruston, and Norfolk soils, very gently sloping phases.	2–5	Good to somewhat excessive.	10+	Mixtures of small areas of Lakeland, Ruston, and Norfolk soils; see separate description of each of these soil series in this table. In some areas several inches of soil material have been removed by erosion and there are some shallow gullies.
Lo	Lakeland, Ruston, and Norfolk soils, gently sloping phases.	5–8	Good to somewhat excessive.	10+	
Lp	Lakeland, Ruston, and Norfolk soils, eroded gently sloping phases.	5–8	Good to somewhat excessive.	10+	
Lr	Lakeland, Ruston, and Norfolk soils, eroded sloping phases.	8–12	Good to somewhat excessive.	10+	
Ls	Lakeland, Ruston, and Norfolk soils, eroded strongly sloping phases.	8–12	Good to somewhat excessive.	10+	

TABLE 8.—*Principal characteristics of soils significant to engineering*—Continued

Map symbol	Soil	Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit
		Percent		*Feet*	
Lt	Lakewood sand, level phase	0–2	Excessive	10+	Thick beds of loose sand (SP; A–3). Soils are on uplands.
Lu	Lakewood sand, very gently sloping phase.	2–5	Excessive	10+	
Lv	Leon sand	0–2	Somewhat poor	1–2	Thick beds of sand (SP; A–3), with organic-cemented layer, 3 to 6 inches thick at depths ranging from 1 to 2½ feet. A thin layer of sandy loam (SM; A–2) may occur on the organic pan. Soil is saturated during prolonged rainy periods. Occurs on uplands.
Lw	Leon sand, light colored surface phase.	0–2	Somewhat poor	1–2	
Lx	Lynchburg gravelly very fine sandy loam.	0–2	Somewhat poor	1–2	Stratified upland materials ranging from sandy loam to sandy clay (SM to CL; A–2 to A–6); gravelly phase contains many rounded iron concretions throughout the profile and occurs adjacent to ponded areas or drainageways.
Ly	Lynchburg fine sandy loam, level phase.	0–2	Somewhat poor	1–2	
Lz	Lynchburg fine sandy loam, very gently sloping phase.	2–5	Somewhat poor	1–2	
Ma	Mixed alluvial land, poorly drained	0–1	Poor	0–1	Heterogenous mixture of soil materials, mainly fine sand to sandy clay loam (SM to CL; A–2 to A–6). Borders streams and is frequently flooded.
Mb	Mixed local alluvial land, moderately well drained.	0–2	Moderately good	1–2	Colluvial-alluvial materials, mainly fine sandy loam (SM or SC; A–2 or A–4) in depressions, shallow drainageways, or near the base of slopes. Depressions may contain ponded water for considerable period after heavy rain. Commonly, the materials below a depth of about 2 feet are sandy clay loam or sandy clay (SC or CL; A–4 or A–6).
Mc	Myatt loamy fine sand, thick surface phase.	0–2	Poor	0–1	Stratified alluvial materials ranging from loamy fine sand to fine sandy clay loam (SM or SC to CL; A–2 to A–6). Parts may be flooded each year; ponded water remains on some areas for a considerable period after a heavy rain. Occurs on low terraces or at the foot of slopes.
Md	Myatt very fine sandy loam, level phase.	0–2	Poor	0–1	
Me	Myatt very fine sandy loam, very gently sloping phase.	2–5	Poor	0–1	
Na	Norfolk fine sandy loam, level phase.	0–2	Good	10+	½ to 1½ feet of fine sandy loam (mainly SM; A–2 or A–4) on strata of sandy loam to sandy clay (SM to CH or MH; A–2 to A–7). Soils are on broad ridgetops.
Nb	Norfolk fine sandy loam, very gently sloping phase.	2–5	Good	10+	
Nc	Norfolk fine sandy loam, gently sloping phase.	5–8	Good	10+	
Pa	Pamlico muck	0–1	Very poor	0	½ to 4 or more feet of muck (Pt; A–5) on mucky sand (SM or OL; A–2 or A–5). Occurs in depressions along streams; soil may be flooded by stream during prolonged rainy periods, and water may be ponded for many months each year.
Pb	Pits, dumps, and made land	(3)	(3)	(3)	Open excavations for removal of gravel or sand, or waste material from these excavations. Also includes artificial fills. Excavated pits may contain water.
Pc	Plummer fine sand	0–2	Poor	0–1	Thick beds of loamy sand or sand (SM or SP; A–2 or A–3). Generally flooded during prolonged rainy periods, and water table remains high throughout the year. Soils are adjacent to streams and drainageways.
Pd	Plummer loamy sand, level phase	0–2	Poor	0–1	
Pe	Plummer loamy sand, very gently sloping phase.	2–5	Poor	0–1	
Pf	Plummer sand	0–2	Poor	0–1	

See footnotes at end of table.

TABLE 8.—*Principal characteristics of soils significant to engineering*—Continued

Map symbol	Soil	Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit
		Percent		*Feet*	
Pg	Portsmouth loam	0–1	Very poor	0–1	About 1 foot of loam or organic loam (ML or CL; A–4 or A–5) on strata of fine sandy clay loam or sandy clay (SC to CH; A–4 to A–7). Generally is in slight depressions on the uplands, and water covers the ground during long periods each year.
Ph	Portsmouth, Grady, and Bayboro soils.	0–1	Very poor	0	Mixtures of small areas of Portsmouth, Grady, and Bayboro soils; see description of Portsmouth and Grady soils above. Bayboro: About 1 foot of fine sandy loam (SM or SC; A–2 or A–4) on strata of fine sandy clay loam to sandy clay (SC to CH; A–4 to A–7). Most areas are covered with water or soils are saturated throughout the year.
Ra	Red Bay fine sandy loam, level phase.	0–2	Good	10+	1 to 2 feet of loamy fine sand or fine sandy loam (SM or SC; A–2 or A–4) over strata of sandy loam to sandy clay (SM to CL; A–2 to A–6). Soils are on uplands.
Rb	Red Bay fine sandy loam, very gently sloping phase.	2–5	Good	10+	
Rc	Red Bay fine sandy loam, gently sloping phase.	5–8	Good	10+	
Rd	Red Bay loamy fine sand, level thick surface phase.	0–2	Good	10+	
Re	Red Bay loamy fine sand, very gently sloping thick surface phase.	2–5	Good	10+	
Rf	Red Bay loamy fine sand, gently sloping thick surface phase.	5–8	Good	10+	
Rg	Rough broken land	8–30	Good	10+	Small areas of steep land, broken by numerous intermittent drainage channels; soil materials range from loamy fine sand to fine sandy clay. Slopes range from 5 to 60 percent, but are predominantly 8 to 30 percent. Red iron crust frequently outcrops on slopes.
Rh	Ruston fine sandy loam, level phase.	0–2	Good	10+	½ to 2 feet of loamy fine sand or fine sandy loam (SM or SC; A–2 or A–4) over strata of sandy loam to sandy clay loam (SM to CL; A–2 to A–6). Gully and sheet erosion have occurred on steeper slopes adjacent to drainageways. Soils are on uplands.
Rk	Ruston fine sandy loam, very gently sloping phase.	2–5	Good	10+	
Rm	Ruston fine sandy loam, gently sloping phase.	5–8	Good	10+	
Rn	Ruston loamy fine sand, level thick surface phase.	0–2	Good	10+	
Ro	Ruston loamy fine sand, very gently sloping thick surface phase.	2–5	Good	10+	
Rp	Ruston loamy fine sand, gently sloping thick surface phase.	5–8	Good	10+	
Rs	Rutlege sand	0–2	Poor	0–1	Thick beds of sand (mainly SP; A–3, but some SM; A–2). The surface layer, about 1 foot thick, has a high content of organic matter. Occurs mainly adjacent to fresh water swamp or in depressions; hence, water stands on ground surface for extensive periods after prolonged rains.
Sa	Savannah fine sandy loam, level thick solum phase.	0–2	Moderately good	10+	About 1 foot of fine sandy loam (mainly SM; A–2 or A–4) on strata of fine sandy clay loam and sandy clay (mainly SC or CL; A–6 or A–7). A firm pan about 6 inches thick, may occur at a depth of less than 3½ feet. Soils are on broad ridgetops.
Sb	Savannah fine sandy loam, very gently sloping thick solum phase.	2–5	Moderately good	10+	

TABLE 8.—*Principal characteristics of soils significant to engineering*—Continued

Map symbol	Soil	Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit
		Percent		*Feet*	
Sc	Stough fine sandy loam	0–2	Somewhat poor	1–2	Stratified alluvial materials that range in texture from loamy sand to sandy clay loam (SM to CL; A–2 to A–6). Occurs on high terraces along the Escambia and Perdido Rivers.
Sd	Sunsweet, Carnegie, and Cuthbert soils, very gently sloping phases.	0–2	Good	10+	Mixtures of small areas of Sunsweet, Carnegie, and Cuthbert soils; see description of Carnegie soil above. Cuthbert soil has 1 to 1½ feet of fine sandy loam (SM or SC; A–2 or A–4) over fine sandy clay (CL or CH; A–6 or A–7); Sunsweet soil has a thinner surface layer over strata of sandy clay loam or sandy clay (SC to CH; A–6 or A–7). Soils have various amounts of concretions throughout the profile.
Se	Sunsweet, Carnegie, and Cuthbert soils, gently sloping phases.	2–5	Good	10+	
Sf	Sunsweet, Carnegie, and Cuthbert soils, eroded sloping phases.	5–8	Good	10+	
Sg	Sunsweet, Carnegie, and Cuthbert soils, severely eroded sloping phases.	5–8	Good	10+	
Ta	Tidal marsh	0–1	Very poor	0	Soil materials are mixed sand, silt, and clay with various quantities of organic matter. Areas are normally covered by water at high tide.
Tb	Tifton fine sandy loam, level phase	0–2	Good	10+	About 1 foot of fine sandy loam (SM or SC; A–2 or A–4), underlain by strata of sandy clay loam and fine sandy clay (SC to CH; A–6 or A–7) small iron concretions usually occur throughout the upper few feet of the soil and comprise 10 to 25 percent of the soil mass at depths of 6 to 18 inches. Soils are on broad ridgetops.
Tc	Tifton fine sandy loam, very gently sloping phase.	2–5	Good	10+	
Td	Tifton fine sandy loam, gently sloping phase.	5–8	Good	10+	
Wa	Wahee very fine sandy loam	0–2	Somewhat poor	1–2	Stratified alluvial material with primary range in texture of silty clay loam to clay (CL or CH; A–6 or A–7), but are normally coarser grained in upper 1½ feet. Occurs on low terraces along the Escambia River.

[1] Dune land. [2] Beach. [3] Variable.

The extent, thickness, and composition of these terraces have not been determined in Escambia County, but all except one have been identified in the county.

Distribution of many of the soil series coincides closely with the kind of parent material. The series change with changes in the relative proportions of sand, silt, and clay in the parent material.

Cuthbert, Angie, Sunsweet, Grady, Bayboro, and Portsmouth soils commonly occur where sandy clays and clays are dominant. The Carnegie, Faceville, Tifton, Savannah, and Irvington soils are in areas where the materials are sandy clay loam and sandy clay.

The Red Bay, Blakely, Ruston, Norfolk, and Lynchburg soils overlie beds of sandy loams to sandy clays. On the moderately thick beds of unconsolidated sands and loamy sands are the Lakeland, Eustis, Klej, and Plummer soils. The Lakewood, Leon, and Rutlege soils were derived from thick beds of sands.

The soils of the stream terraces and those in the first bottoms are from alluvial material. This alluvium has been transported from areas underlain by several different kinds of material, and the direct sources are not known. On the stream terraces are Izagora and Wahee soils that developed from sandy clay to clay materials; Kalmia, Stough, and Myatt soils, from sandy loams to sandy clays; and Huckabee soils derived from sand and loamy sand. The deposits of the first bottoms, or flood plains, are so intricately mixed it is not practical to map the soils separately. On this material an undifferentiated unit is mapped, Mixed alluvial land, poorly drained.

Vegetation

Plants, animals, micro-organisms, and other forms of life on and in the soil contribute to its morphology. The nature of the changes brought about depends, among other things, on the kinds of living things and life processes peculiar to each. The chief functions of plant and animal life, so far as soil profile development is concerned, are to furnish organic matter for the soil and to bring plant nutrients from the low horizons to the upper.

The importance of micro-organisms, earthworms, and other populations in the soil is probably equal to that of the trees, shrubs, grasses and other herbaceous plants, although plants are the primary source of the organic matter in soils. All forms of organisms, both plant and animal, are active in the processes of dissolution, simplification, and synthesis whereby insoluble and unavailable plant nutrients are converted into forms usable by plants.

Escambia County is predominantly in the Southeastern Pine Forest belt. Longleaf pine is the most important species, although some oak is mixed with the pine on the better soils. A small total area of River-Bottom Forest occurs on the bottom lands adjacent to the Escambia and Perdido Rivers. The soils in this area are forested with a mixture of gums, swamp hardwoods, and pines.

The trees common to this region are moderately deep to deep feeders on plant nutrients in the soil. The nutrient content of the leaves varies widely among the various species. In general, however, the leaves of deciduous trees return larger quantities of bases and phosphorus to the soil than the leaves of coniferous plants.

The organic matter from the various plants decomposes fairly rapidly because favorable temperature and moisture prevail most of the time. Organic matter does not accumulate on well-drained sites in this county to the extent that it does in cooler regions under similar conditions of drainage. The vegetation is fairly uniform throughout Escambia County and, therefore, it is not a major factor in producing differences among the soils.

Relief

Relief influences soil formation because it controls drainage, runoff, normal and accelerated erosion, and other water effects. Differences in relief greatly affect the moisture and air conditions within the soil. Even if the parent materials are the same, undulations in the surface encourage the water to drain away from the high places and to collect in the low ones. The soils in the low areas, then, receive more water than those in the higher places. The degree of profile development that takes place within a given time, on a given parent material under the same type of vegetation and climate, depends very much on the amount of water that passes through the soil.

In Escambia County the relief ranges from level to strongly sloping. The southern part of the county is level to very gently sloping and has a few immature stream valleys. The most dissected part of the county borders the Escambia and Perdido Rivers and their larger tributaries. These areas are characterized by steep V-shaped valleys and narrow ridgetops. The interstream divides are broad and smooth.

The influence of relief is reflected in the degree of profile development of some of the soils. The soils of the Izagora, Savannah, and Wahee series have developed from moderately heavy parent materials and have somewhat restricted internal drainage. They occur on nearly level relief and show some evidence of reaching a stage of senility. Although these soils do not have the strongly developed characteristics of planosolic soils, the Izagora and Wahee have a rather abrupt textural change within the profile. Savannah soils have a weakly developed fragipan in the lower subsoil.

TABLE 9.—*Estimated physical and*

[Other soils of the same series that were mapped in the county have essentially the same properties

Map symbol	Soil	Depth from ground surface (typical profile)	Classification	
			Unified	A. A. S. H. O.
		Inches		
Aa	Angie fine sandy loam, very gently sloping phase	0–10	SM	A–2
		10–36	ML or CL	A–6
		36–42	CL	A–6 or A–7
Ba	Barth loamy fine sand	0–6	SM	A–2
		6–24	SM or SC	A–2
		24–42	SM or SC	A–2
Bb	Blakely loam	0–15	ML	A–4
		15–42	SC or CL	A–6
Ca	Carnegie fine sandy loam, level phase	0–10	SM	A–2
		10–18	SM or ML	A–2 or A–4
		18–42	ML or CL	A–6
Cf	Coastal dune land and beach	0–42+	SP	A–3
Ee	Eustis loamy sand, level phase	0–4	SM	A–2
		4–42	SM	A–2
		42+	ML or SC	A–4 or A–6
Fa	Faceville fine sandy loam, level phase	0–12	ML or CL	A–4
		12–42	ML or CL	A–6
Ga	Grady loam	0–6	ML or CL	A–4 or A–6
		6–12	CL	A–6
		12–42	CH	A–7
Ha	Huckabee loamy fine sand, level phase	0–4	SM	A–2
		4–42	SM	A–2
Ia	Irvington fine sandy loam	0–10	SM	A–4
		10–42	SC or CL	A–4 or A–6
Ib	Izagora fine sandy loam	0–12	SM or SC	A–4
		12–28	SC	A–4 or A–6
		28–42	SC or CL	A–6 or A–7
Ka	Kalmia fine sandy loam, level phase	0–12	SM or ML	A–4
		12–42	SC or CL	A–4 or A–6
Kc	Klej loamy sand, level phase	0–12	SM	A–2
		12–42	SM or SC	A–2
Le	Lakeland loamy sand, level phase	0–4	SM	A–2
		4–42	SM	A–2
		42+	ML or SC	A–4 or A–6
Lt	Lakewood sand, level phase	0–4	SP	A–3
		4–42	SP	A–3
Lv	Leon sand	0–4	SP	A–3
		4–18	SP	A–3
		18–22	SP	A–3
		22–42	SP	A–3
Ly	Lynchburg fine sandy loam, level phase	0–12	SM or SC	A–4
		12–24	SC	A–4 or A–6
		24–42	SC	A–4 or A–6
Md	Myatt very fine sandy loam, level phase	0–14	SM or ML	A–4
		14–42	SC or CL	A–6
Na	Norfolk fine sandy loam, level phase	0–12	SM	A–2 or A–4
		12–42	SC or CL	A–4 or A–6
Pa	Pamlico muck	0–30	Pt	A–5
		30–42	SM	A–2 or A–5

See footnotes at end of table.

chemical properties of selected soils

as the one listed; for example, all of the Eustis soils are much like Eustis loamy sand, level phase]

Permeability	Structure	Available moisture-holding capacity	pH	Shrink-swell potential	Suitability as source of topsoil [1]
Inches of water per hour		*Inches of water per foot of soil*			
2. 5–5	Crumb	1. 1	4. 5–5. 5	Low	Good.
0. 2–0. 8	Subangular blocky	1. 4	4. 5–5. 2	Moderate	Fair.
0. 05–0. 2	Subangular blocky		4. 5–5. 0	Moderate to high	Poor.
5–10	Crumb	. 9	4. 5–5. 5	Low	Fair.
10+	Crumb	. 8	4. 5–5. 5	Low	Fair.
10+	Crumb	. 8	4. 5–5. 5	Low	Fair.
2. 5–5	Crumb	1. 5	5. 0–6. 0	Low	Good.
5–10	Subangular blocky	1. 4	4. 5–5. 0	Low to moderate	Fair.
5–10	Crumb	1. 1	4. 5–5. 5	Low	Good.
5–10	Crumb	1. 4	4. 5–5. 0	Low	Fair.
0. 2–0. 8	Subangular blocky	1. 4	4. 5–5. 0	Moderate	Fair.
10+	Single grain		7. 0+	Low to none	Unsuitable.
10+	Single grain	1. 0	5. 0–6. 0	Low	Fair.
10+	Single grain	. 8	5. 0–6. 0	Low	Poor to fair.
5–10	Single grain to crumb		5. 0–5. 5	Moderate	Poor to fair.
5–10	Crumb	1. 1	5. 0–6. 0	Low	Good.
0. 8–2. 5	Subangular blocky	1. 3	4. 5–5. 0	Moderate	Fair.
2. 5–5	Crumb	1. 3	4. 5–5. 5	Moderate	Fair to good.
2. 5–5	Subangular blocky	1. 1	4. 5–5. 0	Moderate	Fair.
[2] 0. 05	Massive		4. 5–5. 0	High	Poor.
10+	Crumb	. 8	5. 0–6. 0	Low	Fair.
10+	Crumb	. 7	5. 0–6. 0	Low	Poor to fair.
5–10	Crumb	1. 1	4. 5–5. 5	Low	Good.
0. 8–2. 5	Subangular blocky	1. 3	4. 5–5. 0	Low to moderate	Fair to good.
2. 5–5	Crumb	1. 1	4. 5–5. 5	Low	Good.
0. 2–0. 8	Subangular blocky	1. 3	4. 5–5. 0	Low to moderate	Fair.
0. 05–0. 2	Subangular blocky	1. 3	4. 5–5. 0	Moderate to high	Poor.
2. 5–5	Crumb	1. 1	4. 5–5. 5	Low	Good.
5–10	Subangular blocky	1. 4	4. 5–5. 0	Moderate	Fair.
5–10	Crumb	. 9	4. 5–5. 5	Low	Fair.
10+	Crumb	. 8	4. 5–5. 0	Low	Poor to fair.
10+	Single grain	. 8	5. 0–6. 0	Low	Fair.
10+	Single grain	. 7	5. 0–6. 0	Low	Poor to fair.
5–10	Single grain to crumb		5. 0–5. 5	Low to moderate	Poor to fair.
10+	Single grain	. 4	4. 5–5. 5	Low	Poor to fair.
10+	Single grain	. 4	5. 0–6. 0	Low to none	Unsuitable.
10+	Single grain	. 4	4. 5–5. 5	Low	Fair.
10+	Single grain	. 4	4. 5–5. 0	Low to none	Poor.
5–10	Massive	. 4	4. 0–4. 5	Low	Unsuitable.
10+	Single grain	. 4	4. 5–5. 5	Low to none	Unsuitable.
5–10	Crumb	1. 0	4. 5–5. 5	Low	Good.
2. 5–5	Subangular blocky	1. 2	4. 5–5. 0	Low to moderate	Fair.
0. 2–0. 8	Subangular blocky	1. 2	4. 5–5. 0	Low to moderate	Fair.
5–10	Crumb	1. 1	4. 5–5. 5	Low	Poor.
0. 2–0. 8	Subangular blocky	1. 2	4. 5–5. 0	Moderate	Poor.
2. 5–5	Crumb	1. 1	5. 0–5. 5	Low	Good.
5–10	Subangular blocky	1. 4	4. 5–5. 0	Moderate	Fair.
[3]	Structureless	2. 0+	4. 0–5. 0	Moderate to high	Unsuitable.[4]
[3]	Structureless		4. 0–5. 0	Moderate	Poor to unsuitable.

TABLE 9.—*Estimated physical and*

Map symbol	Soil	Depth from ground surface (typical profile)	Classification	
			Unified	A. A. S. H. O.
		Inches		
Pd	Plummer loamy sand, level phase	0–4	SM	A–2
		6–42	SM	A–2
Pg	Portsmouth loam	0–14	ML or OL	A–4 or A–5
		14–42	SC or CL	A–4 or A–6
Ra	Red Bay fine sandy loam, level phase	0–12	SM	A–2
		12–42	SC	A–4 or A–6
Rd	Red Bay loamy fine sand, level thick surface phase	0–14	SM	A–2
		14–42	SM or SC	A–2 or A–4
Rh	Ruston fine sandy loam, level phase	0–10	SM or SC	A–4
		10–24	SC or CL	A–4 or A–6
		24–42	ML or CL	A–6
Rn	Ruston loamy fine sand, level thick surface phase	0–12	SM	A–2
		12–42	SM or SC	A–4
Rs	Rutlege sand	0–12	SM	A–2
		12–42	SP	A–3
Sa	Savannah fine sandy loam, level thick solum phase	0–10	SM	A–2 or A–4
		10–36	SC	A–4 or A–6
		36–42	SC or CL	A–6
Sc	Stough fine sandy loam	0–12	SM	A–2 or A–4
		12–42	SC or CL	A–6
Tb	Tifton fine sandy loam, level phase	0–10	SM or SC	A–2 or A–4
		10–36	SC or CL	A–6
		36–42	CL or CH	A–6 or A–7
Wa	Wahee very fine sandy loam	0–5	SC	A–4
		5–16	SC or CL	A–6
		16–22	CL or CH	A–6 or A–7
		22–42	CH	A–7

[1] Topsoil is material used for topdressing roadbanks.
[2] Less than 0.05 inches of water per hour.
[3] Wide local variation in permeability.

chemical properties of selected soils—Continued

Permeability	Structure	Available moisture-holding capacity	pH	Shrink-swell potential	Suitability as source of topsoil [1]
Inches of water per hour		*Inches of water per foot of soil*			
10+	Crumb	0. 7	4. 5–5. 5	Low	Fair.
5–10	Crumb	. 5	4. 5–5. 5	Low	Poor.
5–10	Crumb	1. 1	4. 5–5. 5	Low to moderate	Good.
5–10	Subangular blocky	1. 2	4. 5–5. 5	Moderate	Fair.
5–10	Crumb	1. 1	5. 0–5. 5	Low	Good.
2. 5–5	Subangular blocky	1. 4	4. 5–5. 0	Moderate	Fair.
10+	Crumb	1. 1	5. 0–5. 5	Low	Fair to good.
5–10	Crumb	1. 4	4. 5–5. 0	Low	Fair.
5–10	Crumb	1. 1	5. 0–5. 5	Low	Good.
10+	Crumb	1. 4	4. 5–5. 0	Low to moderate	Fair.
0. 8–2. 5	Subangular blocky		4. 5–5. 0	Moderate	Fair.
10+	Crumb	1. 1	5. 0–5. 5	Low	Fair to good.
5–10	Crumb	1. 4	4. 5–5. 0	Low	Fair.
5–10	Crumb	1. 1	4. 5–5. 5	Low	Good.
10+	Crumb to single grain	. 4	4. 5–5. 5	Low to none	Poor to fair.
5–10	Crumb	1. 1	4. 5–5. 5	Low	Good.
2. 5–5	Subangular blocky	1. 4	4. 5–5. 0	Low to moderate	Fair.
0. 2–0. 8	Massive	1. 4	4. 5–5. 0	Moderate	Poor to fair.
5–10	Crumb	1. 1	4. 5–5. 5	Low	Good.
2. 5–5	Subangular blocky	1. 4	4. 5–5. 0	Moderate	Fair.
5–10	Granular to crumb	1. 1	4. 5–5. 5	Low	Good.
5–10	Subangular blocky	1. 4	4. 5–5. 0	Moderate	Fair.
0. 2–0. 8	Subangular blocky	1. 4	4. 5–5. 0	Moderate to high	Poor to fair.
2. 5–5	Crumb	1. 0	4. 5–5. 5	Low to moderate	Fair to good.
0. 8–2. 5	Subangular blocky	1. 3	4. 5–5. 0	Moderate	Fair.
0. 2–0. 8	Subangular blocky		4. 5–5. 0	Moderate to high	Poor.
0. 2–0. 8	Subangular blocky		4. 5–5. 0	High	Unsuitable.

[1] Muck may be used as a topdressing to improve fertility of other topsoil material.

TABLE 10.—*Soil features affecting*

Soil series or land type and symbols for mapping units	Features affecting vertical alignment of highways		Suitability of soil material for—	
	Materials	Drainage	Road subgrade [1]	Embankment [1]
Angie (Aa)	Sandy clay	Erosion; slow internal movement of water.	Poor to fair	Fair
Barth (Ba)	Deep sand	High water table	Good	Good
Blakely (Bb)	Friable sandy clay loam substrata.	Moderately rapid internal movement of water.	Fair to good	Good
Carnegie (Ca, Cb, Cc, Cd, Ce)	Friable sandy clay substrata.	Erosion; moderately slow internal movement of water.	Fair	Fair to good
Coastal dune land and beach (Cf).	Sand susceptible to wind and water erosion.	High water table	Good	Good, with gentle slopes; easily eroded.
Eustis (Ea, Eb, Ec, Ed, Ee, Ef, Eg, Eh, Ek, Em, En).	Sand; sandy clay substrata below 30 inches.	Rapid internal movement of water.	Good	Good
Faceville (Fa, Fb)	Friable sandy clay loam substrata.	Erosion; moderately rapid internal movement of water.	Fair to good	Good
Fresh water swamp (Fc)	Organic matter; clay strata; variable.	High water table	Very poor to poor [2]	Poor to fair [2]
Grady (Ga)	Silty clay substrata	High water table; depressions with ponded water.	Very poor to poor	Poor to fair
Gullied land (Gb)	Sandy clay loam strata	Erosion	Poor to good	Fair to good
Huckabee (Ha, Hb)	Deep sand	Rapid internal movement of water.	Good	Good
Irvington (Ia)	Sandy clay loam substrata	High water table	Poor to fair	Fair to good
Izagora (Ib)	Sandy clay substrata	High water table	Poor to fair	Fair to good
Kalmia (Ka, Kb)	Friable sandy clay loam substrata.	High water table	Fair to good	Good
Klej (Kc, Kd, Ke, Kf)	Deep sand	High water table	Good	Good; sand is easily eroded on steep slopes.
Lakeland (La, Lb, Lc, Ld, Le, Lf, Lg, Lh, Lj, Lk, Ll, Lm).	Deep sand; sandy clay substrata below 30 inches in some areas.	Rapid internal movement of water.	Good	Good; sand is easily eroded on steep slopes.
Lakeland, Ruston, and Norfolk (Ln, Lo, Lp, Lr, Ls).	Sandy clay substrata; materials variable.	Rapid internal movement of water.	Poor to good	Fair to good; sand is easily eroded on steep slopes.
Lakewood (Lt, Lu)	Deep sand	Rapid internal movement of water.	Good	Good if slopes are gentle; easily eroded.
Leon (Lv, Lw)	Deep sand	High water table	Good	Good if slopes are gentle; easily eroded.
Lynchburg (Lx, Ly, Lz)	Sandy clay loam substrata	High water table	Fair to good	Good
Mixed alluvial land (Ma)	Variable material	High water table; frequently flooded.	Fair to good	Good
Mixed local alluvial land (Mb)	Sandy clay substratum	High water table; frequently flooded.	Fair to good	Good
Myatt (Mc, Md, Me)	Variable material	High water table; frequently flooded.	Fair to good	Good
Norfolk (Na, Nb, Nc)	Sandy clay loam substrata.	Moderate internal movement of water.	Poor to good	Fair to good
Pamlico muck (Pa)	Muck	High water table; frequent flooding in some areas.	Muck is unsuitable; [2] mucky sand and sand are very poor to fair.	Muck is unsuitable; [2] mucky sand and sand are poor to fair.
Pits, dumps, and made land (Pb)	Mixed materials	Not rated	Not rated	Not rated

See footnotes at end of table.

highway work and conservation work

Features affecting conservation work with—			
Dikes	Farm ponds	Drainage	Irrigation
Not applicable	Good sandy clay substrata	Low permeability of subsoil	Moderate intake rate; medium moisture-holding capacity.
Deep sand	Level to nearly level terrain; high water table; occasional overflow.	Level to nearly level terrain; high water table; high permeability.	Rapid intake rate; low moisture-holding capacity.
Not applicable	Location unfavorable; good material for embankments.	Depressions; good internal drainage.	Rapid intake rate; high available moisture-holding capacity.
Not applicable	Good material for embankments	Moderately permeable subsoil	Moderate intake rate; high available moisture-holding capacity; high erodibility.
Deep sand	Not suitable	Highly permeable sands	No agricultural use.
Not applicable	Very permeable; deep to water table.	Highly permeable sands	High intake rate; low available moisture-holding capacity.
Not applicable	Good material for embankments	Moderately permeable subsoils	Moderate intake rate; high available moisture-holding capacity; erodible.
Variable material; highly organic in place.	Low position; overflow; variable depth to good foundation; organic.	Low position; overflow	No agricultural use.
Plastic clay	Tight plastic material; low wet position.	Depressions; slow internal drainage; high water table.	Naturally very wet.
Not applicable	Materials variable	Steep slopes; rapid surface runoff	No agricultural use.
Not applicable	Very permeable; deep to water table.	Highly permeable sands	High intake rate; low available moisture-holding capacity.
Sandy clay subsoil	Low position; high water table; good material for embankment.	Poor relief; high water table; slow internal drainage.	High water table; good intake rate; moderately high moisture-holding capacity.
Sandy clay subsoil	Low position; high water table; good material for embankment.	Level to nearly level terrain; high water table. Slow internal movement.	Low permeability in substratum; moderately high available moisture-holding capacity.
Not applicable	Fair material for embankment	Some nearly level areas; water table at moderate depth; moderate internal drainage.	Good intake rate; good moisture-holding capacity.
Very permeable materials.	High water table; very permeable	Nearly level terrain; very permeable; high water table.	High intake rate; low moisture-holding capacity; high water table.
(3)	Very permeable; deep to water table.	Rapid internal movement of water.	High intake rate; low moisture-holding capacity.
(3)	Good material for embankments and foundations.	Moderately permeable subsoil	High intake rate; moderate moisture-holding capacity.
(3)	Very permeable; deep to water table.	Highly permeable sands	High intake rate; very low moisture-holding capacity.
Very permeable materials.	Level to nearly level terrain; high water table; very permeable.	Poor relief; high water table; easily eroded.	High water table; low moisture-holding capacity; rapid internal movement of water.
Sandy loam subsoil	High water table; fair material for embankments and foundations.	High water table; medium to low permeability in substrata.	High water table; medium moisture-holding capacity.
Variable material; sand to sandy clay loam.	Stratification; variable permeability; high water table.	High water table	Little agricultural use.
Variable material; sand to sandy clay.	Stratification; variable permeability; high water table.	High water table; seepage	Naturally wet.
Variable material; stratification.	Stratification; variable material	Variable material and permeability.	High water table; variable intake rate.
(3)	Good materials for foundations and embankments.	Moderately permeable subsoils	Moderate intake rate; erodible; high moisture-holding capacity.
Muck oxidizes rapidly	(3)	Periodic flooding; subsidence; sand substratum.	Rarely used.
(3)	Pits fill with water	Variable materials	Not used.

TABLE 10.—*Soil features affecting*

Soil series or land type and symbols for mapping units	Features affecting vertical alignment of highways		Suitability of soil material for	
	Materials	Drainage	Road subgrade [1]	Embankment [1]
Plummer (Pc, Pd, Pe, Pf)	Deep sands	High water table	Good	Good; sand is easily eroded if slopes are steep.
Portsmouth (Pg)	Organic matter at surface; sandy clay subsoil.	High water table; depressions contain ponded water.	Poor to fair [2]	Poor to fair [2]
Portsmouth, Grady, and Bayboro (Ph).	Organic matter in places	High water table; depressions contain ponded water.	Very poor to fair [2]	Poor to fair [2]
Red Bay (Ra, Rb, Rc, Rd, Re, Rf).	Sandy clay loam substrata	Moderate; internal movement of water.	Good	Good
Rough broken land (Rg)	Variable materials in substratum.	Erosion	Fair to good	Fair to good
Ruston (Rh, Rk, Rm, Rn, Ro, Rp).	Sandy clay loam substrata	Erosion	Good	Good
Rutlege (Rs)	Organic matter at surface	High water table; depressions contain ponded water.	Good	Good if slopes are gentle; easily eroded.
Savannah (Sa, Sb)	Sandy clay substrata	Erosion	Fair to good	Good
Stough (Sc)	Sandy clay loam substrata	High water table	Good	Good
Sunsweet, Carnegie, and Cuthbert (Sd, Se, Sf, Sg).	Sandy clay substrata	Erosion	Fair	Fair to good
Tidal marsh (Ta)	Organic matter; clay strata	Tide water	Very poor to fair [2]	Poor to fair [2]
Tifton (Tb, Tc, Td)	Sandy clay loam substrata	Erosion	Fair to good	Fair to good
Wahee (Wa)	Clay strata	High water table	Poor	Fair

[1] Rating is for soil materials at approximately the optimum moisture content for proper compaction, with provision for proper surface drainage and subdrainage.

[2] Muck and organic materials are normally excavated and wasted, or used as topdressing on slopes to promote the growth of vegetation.

highway work and conservation work—Continued

Features affecting conservation work with—			
Dikes	Farm ponds	Drainage	Irrigation
Very permeable material	Low position; permeable; high water table.	High water table; erodible	High water table; rapid permeability.
Sandy clay substrata	Occupies natural depressions; high water table.	Depressions; periodic flooding; slow internal drainage.	High water table; moderate permeability.
Sandy clay loam subsoils	Occupies natural depressions; high water table.	Depressions; periodic flooding; slow internal drainage.	High water table.
(3)	Good material for foundations and embankments.	Moderately permeable subsoils	Good intake rate; good moisture-holding capacity.
(3)	Materials variable	Steep slopes; rapid surface runoff.	(3).
(3)	Good material for foundations and embankments.	Moderately permeable subsoils	Good intake rate; good available moisture-holding capacity.
Very permeable	Occupies natural depressions; high water table.	Moderately permeable; depressions or flat areas; periodic flooding.	High water table.
(3)	Good material for foundations and embankments.	Slowly permeable subsoils	High intake rate; moderately high moisture-holding capacity; slowly permeable claypan.
(3)	Variable material; laminated substrata.	Variable material and permeability.	High water table; variable intake rate.
(3)	Materials variable, steep slopes	Steep slopes; rapid surface runoff.	Slow intake rate; low permeability; moisture-holding capacity.
Variable material; organic, sand or clay.	Saline	Variable material; overflowed at high tide; soil chemical problems involved in drainage.	Not used for agriculture.
(3)	Good material for foundations and embankments.	Slowly permeable subsoils	Medium intake rate; low permeability; good moisture-holding capacity.
Stratification	Variable material	Variable material; high water table.	Slow intake rate.

Excavation may be impractical when water table is high, but organic materials may be excavated in any moisture condition.

[3] No specific feature affecting the use specified at the head of the column.

Normal, or zonal, soils developed on gently undulating relief, from moderately heavy parent material, where there is sufficiently permeable substratum to carry off excess ground water slowly. Some of the soils that generally occur on the steeper slopes do not have strongly developed profiles. However, the degree of profile development of these soils is partially affected by the texture of the parent material.

Time

Time is important in the formation of soils. The time required for formation of a given kind of soil depends largely on the other factors involved—climate, living things, parent material, and relief. The time required to develop a profile in equilibrium with the active factors of soil genesis is less on an acid parent material that has a relatively high content of quartz than on heavy clay material that has a high content of lime. Development of a normal, or mature, profile on very gentle slopes requires less time than development of one on a steep slope, because, on the steep slopes, the rate of geologic erosion is faster and the amount of percolation is smaller. There is no direct relationship between age, in terms of years, and the degree of profile development, nor between the maturity of a soil and the age of the material underneath.

In Escambia County some of the nearly level soils are showing evidence of postmature development. Other soils, those nearly in equilibrium with the forces of weathering, are generally on very gentle slopes. They developed from sandy loam to sandy clay parent materials. Soils such as the Norfolk, Ruston, Red Bay, Tifton, Carnegie, and Blakely are approaching the mature stage of development.

The young, or immature, profiles are on steep slopes and developed from very sandy parent material, or they are in first bottoms where new materials are frequently added by floodwaters. The Cuthbert, Sunsweet, Lakeland, and Eustis are sloping soils that have an immaturely developed profile. In all of these soils the parent material and slope have influenced the degree of profile development.

The Lakeland and Lakewood soils also are examples of soils on nearly level relief that have immaturely developed profiles. In these soils the low degree of development results from the sandiness of the parent material. In the first bottoms, the soils show little profile differentiation, primarily because new soil material is deposited each time the stream overflows.

Classification of Soils

Soils are classified in progressively more inclusive categories. The three lowest categories—phase, type, and series—are discussed in the section, How Soils are Mapped and Described. The highest category, the soil order, has three divisions—zonal, intrazonal, and azonal soils. Each of these main divisions contains several great soil groups. The soil series of Escambia County are classified by order and great soil group as shown in the following list. The classification is made primarily on the basis of characteristics observed in the field. Modifications may become necessary as more is learned about the soils.

ZONAL ORDER

Red-Yellow Podzolic great soil group:
- Angie series
- Carnegie series
- Faceville series
- Irvington series
- Izagora series
- Kalmia series
- Norfolk series
- Ruston series
- Tifton series

Reddish-Brown Lateritic great soil group:
- Blakely series
- Red Bay series

INTRAZONAL ORDER

Planosol great soil group:
- Savannah series
- Stough series
- Wahee series

Low-Humic Gley great soil group:
- Grady series
- Lynchburg series
- Myatt series
- Plummer series

Humic Gley great soil group:
- Bayboro series
- Pamlico series
- Portsmouth series
- Rutlege series

Ground-Water Podzol great soil group:
- Leon series

AZONAL ORDER

Regosol great soil group:
- Barth series
- Cuthbert series
- Eustis series
- Huckabee series
- Klej series
- Lakeland series
- Lakewood series
- Sunsweet series

On the following pages the soil orders and great soil groups are defined and a representative profile is described for each great soil group.

Zonal soils

Zonal soils are defined as one of those great groups of soils that have well-developed characteristics that reflect the influence of the active factors of soil genesis—climate and living organisms (chiefly vegetation) (*8*).

The normal, or zonal, soil profile serves as a basis for comparison in the taxonomic classification of soils. In Escambia County this profile has a grayish-brown to reddish-brown, friable surface soil of fine sandy loam to sandy loam texture; its B horizon, or subsoil, has a uniformly red to yellow color, a friable to firm consistence, and a sandy clay loam to sandy clay texture. The C horizon, or parent material, is commonly mottled with brown, yellow, and red, and in texture it ranges from unconsolidated sandy loam to sandy clay.

In thickness, the horizons vary somewhat in different zonal soils of the county: The A horizon ranges from 8 to 12 inches; the B, from 12 to 36 inches; and the C horizon, from a few inches to many feet.

The normal, or mature, soil profiles have developed mainly on very gently sloping or smoother interstream divides. The zonal soils of Escambia County are members of the Red-Yellow Podzolic and Reddish-Brown Lateritic great soil groups.

RED-YELLOW PODZOLIC SOILS

Red-Yellow Podzolic soils are a group of well-developed, well-drained, acid soils that have thin organic (A_0) and organic-mineral (A_1) horizons over a light-colored, bleached (A_2) horizon; the A_2 horizon, in turn, overlies a red, yellowish-red or yellow, more clayey (B) horizon. The parent materials are all more or less siliceous. Coarse reticulate streaks or mottles of red, yellow, brown, and light gray are characteristic in the deep horizons of Red-Yellow Podzolic soils where parent materials are thick (*7*).

In Escambia County, the soils having the characteristics of Red-Yellow Podzolic soils belong to the Norfolk, Ruston, Kalmia, Faceville, Tifton, Carnegie, Angie, Irvington, and Izagora series. Although the soils may vary somewhat in maturity, all have at least a moderately well developed Red-Yellow Podzolic profile.

The dominant components in the colloids of the Norfolk and Ruston soils are kaolinite, quartz, illite, and hydrous mica, and smaller amounts of feldspar, vermiculite, gibbsite, and montmorillonite. The cation-exchange capacity of the clay shows general agreement with the crystalline mineralogical estimation (*4*).

In this county, Norfolk fine sandy loam, very gently sloping phase, has a profile representative of the Red-Yellow Podzolic group. The following describes a profile examined in a well-drained area under a natural cover of pine and wiregrass; the site was near United States Highway 29, half a mile south of the intersection with State Highway 99.

Profile:

- A_1 0 to 5 inches, light-gray (10YR 7/2, dry) fine sandy loam; friable; moderate fine crumb structure; contains small amount of organic matter.
- A_2 5 to 12 inches, yellow (10YR 7/8, dry) fine sandy loam; friable; moderate fine crumb structure.
- B_1 12 to 18 inches, brownish-yellow (10YR 6/8) fine sandy loam to fine sandy clay loam; friable; weak medium subangular blocky structure crushing to moderate fine crumb.
- B_2 18 to 32 inches, brownish-yellow (10YR 6/8) fine sandy clay loam; friable; moderate medium subangular blocky structure crushing to moderate fine crumb.
- B_3 32 to 42 inches, brownish-yellow (10YR 6/8) fine sandy clay loam with faint, moderate, medium reddish-yellow (7.5YR 6/8) mottlings in lower part; friable; moderate medium subangular blocky structure.
- C 42 to 54 inches, brownish-yellow (10YR 6/8) fine sandy clay loam moderately mottled with distinct, medium areas of strong brown (7.5YR 5/8), yellow (2.5Y 7/6) and red (2.5YR 4/8); friable to firm.

The Tifton soil profile is similar to that of the Norfolk soil, but it has a somewhat finer texture in the subsoil and a greater number of iron concretions on the surface and throughout the profile. The Ruston, Carnegie, and Faceville soils differ from Norfolk soil primarily in having a yellowish-red subsoil. The Carnegie soils also contain iron concretions throughout the profile. Kalmia and Izagora soils differ from Norfolk soil primarily because they developed from moderately young alluvium on stream terraces. In addition, the Izagora soils have much finer texture in the lower horizons.

The Angie and Irvington soils have a finer textured subsoil than the Norfolk soils, and the Irvington also contains more iron concretions. The Angie and Irvington soils are somewhat less well drained than the Norfolk soils.

REDDISH-BROWN LATERITIC SOILS

Reddish-Brown Lateritic soils are a zonal group of soils having a dark reddish-brown, granular surface soil; a red, friable clay B horizon; and red or reticulately mottled lateritic parent material; they developed under forest vegetation in a humid, tropical or subtropical climate.

In this county, soils of the Red Bay and Blakely series belong to the Reddish-Brown Lateritic great soil group. Laterization, with little or no podzolization, has dominated in development of these soils. In the laterization process, silica is removed and there is, consequently, an increase in the content of alumina and iron and a decrease in the base-exchange capacity of the soil.

The A horizon of the Blakely and Red Bay soils is a brown to dark reddish-brown, friable fine sandy loam. The soils do not have the light-grayish A_2 horizons seen in soils of podzolic morphology. The B horizon of the Reddish-Brown Lateritic soils is red to dark reddish-brown friable to firm fine sandy clay loam. The C horizon, or parent material, consists of red, friable fine sandy clay loam mottled with yellow and brown. The C horizon contains less of fine-textured materials than the B horizon.

The crystalline components dominant in the clay fraction of Red Bay soils in Escambia and Santa Rosa Counties are gibbsite and kaolinite, but there are lesser amounts of quartz, illite, montmorillonite, vermiculite, and feldspar. The exchange capacities of these soils are in general agreement with the crystalline mineralogical estimate (*4*).

Representative of the Reddish-Brown Lateritic soils in this county is Red Bay fine sandy loam, gently sloping phase. The following describes a profile under a cover of oak and pine forest in a well-drained position along a road:

- A_1 0 to 4 inches, dark reddish-brown (5YR 3/2) fine sandy loam; friable; weak fine crumb structure; contains a moderate amount of organic matter.
- A_2 4 to 14 inches, reddish-brown (5YR 4/4) fine sandy loam; friable; weak fine crumb structure.
- B_1 14 to 20 inches, red (2.5YR 4/6) fine sandy clay loam; friable; weak fine crumb and weak medium subangular blocky structure.
- B_{21} 20 to 36 inches, red (10R 4/6) fine sandy clay loam; friable; medium subangular blocky structure crushing to moderate fine crumb.
- B_{22} 36 to 42 inches, dark-red (10R 3/6) fine sandy clay loam; friable to firm; moderate medium subangular blocky structure crushing to moderate medium and fine crumb.

Blakely soils have a profile similar to that of the Red Bay, but the surface soil is darker and the B horizon is generally somewhat finer textured.

Intrazonal soils

Intrazonal soils have more or less well-developed soil characteristics that reflect the dominating influences of some local factor of relief or parent material over the normal effect of climate and vegetation (*8*). The intrazonal soils of this county are members of the Planosol, Low-Humic Gley, Humic Gley, and Ground-Water Podzol great soil groups.

PLANOSOLS

Planosols are an intrazonal group of soils having an eluviated surface horizon underlain by a B horizon that is more strongly illuviated and cemented, or compacted than the corresponding horizon in associated normal (zonal) soils; the Planosols developed on nearly level upland surfaces, under a grass or forest vegetation, in a humid or subhumid climate (*8*). Characteristic of the Planosols is their location in nearly level areas, their somewhat restricted drainage, and a well-defined layer of clay or cemented material at varying depths below the surface. The soils of this county classified as Planosols —the Savannah, Wahee, and Stough—have developed strongly the characteristics of Planosols. Nevertheless, there is a rather abrupt change to a finer texture in their profiles.

Representative of the Planosols in this county is Savannah fine sandy loam, level thick solum phase. Following is a profile of this soil under a thin, natural cover of hardwoods and some pine:

- A_1 0 to 3 inches, grayish-brown (10YR 5/2, dry) fine sandy loam; friable; weak fine crumb structure; contains a fairly good amount of organic matter.
- A_2 3 to 7 inches, brownish-yellow (10YR 6/6) fine sandy loam; friable; fine crumb structure; contains small amount of organic matter and a few live roots and pores.
- B_1 7 to 13 inches, yellow (10YR 7/8) fine sandy clay loam; friable; weak medium subangular blocky structure.
- B_2 13 to 20 inches, brownish-yellow (10YR 6/8) fine sandy clay loam; friable; weak subangular blocky structure crushing to fine crumb.
- B_3 20 to 27 inches, brownish-yellow (10YR 6/6) fine sandy clay loam mottled with a few, distinct, medium, red (10R 5/8) areas; firm.
- C_1 27 to 36 inches, mottled red (10R 5/8), brownish-yellow (10YR 6/8), and pale-yellow (2.5Y 7/4) fine sandy clay loam; firm.
- C_2 36 to 50 inches, mottled red (10R 5/8), brownish-yellow (10YR 6/8), and pale-yellow (2.5Y 7/4) fine sandy clay loam; firm.

The Wahee soil differs from the Savannah soils in having a finer textured subsoil and in being more poorly drained. The Stough soil has a coarser textured subsoil and is somewhat less well drained than the Savannah. The Wahee and Stough soils developed from moderately young alluvium on stream terraces.

LOW-HUMIC GLEY SOILS

Low-Humic Gley soils are an intrazonal group of imperfectly drained to poorly drained soils having a very thin surface horizon, moderately high in organic matter, over mottled gray and brown gleylike mineral horizons that have little difference in texture (*7*). The soils of this great group have a surface soil that ranges from sand to loam. In this county, soils of the Lynchburg, Grady, Myatt, and Plummer series are members of the Low-Humic Gley great soil group.

Myatt very fine sandy loam has a profile typical of the Low-Humic Gley soils in this county. The following describes a profile along the Escambia River, on a low terrace, under a native cover of gum, cypress, bay, and other water-tolerant shrubs and grasses:

- A_1 0 to 4 inches, light brownish-gray (2.5Y 6/2) very fine sandy loam; friable; weak fine crumb structure; contains small amount of organic matter.
- A_2 4 to 12 inches, light-gray (2.5Y 7/2) very fine sandy loam with a few, fine, distinct mottles of brownish yellow (10YR 6/8); friable; weak medium crumb structure.
- B_1 12 to 18 inches, light brownish-gray (2.5Y 6/2) very fine sandy loam with common, medium, distinct mottles of brownish yellow (10YR 6/8); friable; weak fine subangular blocky structure crushing to weak medium crumb.
- B_2 18 to 36 inches, light brownish-gray (2.5Y 6/2) fine sandy clay loam with common, medium, distinct mottles of brownish yellow (10YR 6/8); friable; weak fine subangular blocky structure.
- C 36 to 42 inches, fine sandy clay loam with many, medium, prominent mottles of light brownish gray (10YR 6/2), brownish yellow (10YR 6/8), and reddish yellow (5YR 6/8); friable; weak medium subangular blocky structure.

The Plummer soils differ from the Myatt in occupying upland positions and in having a sand or loamy sand texture throughout their profile. The Grady soils are in slight depressions and shallow drainageways on the upland and, throughout their profile, have more fine-textured materials than the Myatt soils. Lynchburg soils differ from the Myatt soils because they occupy uplands, are better drained, and have more yellow coloring throughout their profile.

HUMIC GLEY SOILS

Humic Gley soils are an intrazonal group of poorly drained to very poorly drained hydromorphic soils that have a dark-colored organic-mineral horizon of moderate thickness over mineral gley horizons (*7*).

The Humic Gley soils of this county are members of the Rutlege, Portsmouth, Bayboro, and Pamlico series. Rutlege sand is representative of these soils. The following describes a profile under a natural cover of gum, bay, gallberry, and scattered pines:

- A_1 0 to 10 inches, black (10YR 2/1) fine sand; loose; structureless; high content of organic matter.
- A_2 10 to 42 inches, very dark gray (10YR 3/1) to dark-gray (10YR 4/1) fine sand; loose; structureless; moderate amount of organic matter in upper part of layer.

The Portsmouth soils differ from the Rutlege in having a finer textured surface soil and a grayish-brown, firm, fine sandy clay loam subsoil. The Pamlico soil has a significantly higher content of organic matter than the other Humic Gley soils in the county. The Bayboro soils contain more fine-textured material and are less friable in the deeper horizons than the Portsmouth soils.

GROUND-WATER PODZOLS

Ground-Water Podzols are defined as intrazonal groups of soils having a thin organic layer over a strongly leached light-gray layer of sand, which rests on a black or dark grayish-brown organic or iron hardpan; these soils developed on somewhat poorly drained or poorly drained sandy materials in humid climates.

Leon sand is the only Ground-Water Podzol in Escambia County. The soil has a low content of organic matter

in the A_1 horizon, and the A_2 horizon is highly leached. The A_2 is underlain by an organic-matter stained pan that may be defined as a B horizon in which organic matter and mineral constituents have accumulated.

The following describes a profile of Leon sand under a natural cover of pine forest, saw-palmetto, and wiregrass:

- A_1 0 to 4 inches, dark-gray (10YR 4/1) to very dark gray (10YR 3/1) sand; loose; structureless.
- A_2 4 to 18 inches, light-gray (10YR 7/1) sand; loose; structureless.
- B_2 18 to 22 inches, dark reddish-brown (5YR 3/2) sand; weakly cemented; massive structure; this layer is an organic-matter stained pan.
- B_3 22 to 28 inches, yellow (10YR 7/8) sand mottled with reddish yellow (7.5YR 6/8); loose; structureless.
- C 28 to 42 inches, sand mottled with yellow (10YR 7/8), reddish yellow (7.5YR 6/8), very pale brown (10YR 7/4), and white (10YR 8/1); loose; structureless.

Azonal soils

Azonal soils are any group of soils lacking the well-developed profile characteristics that result from the influence of age, condition of parent material, or relief. These poorly developed, or young, soils occur on stronger slopes on broken relief near drainageways, in areas of deep sands, and in first bottoms where materials are deposited by floodwaters and drainage is unfavorable.

In this county, the azonal soils are members of the Regosol great soil group. There are two miscellaneous land types derived from alluvium, but no soils are classified as members of the Alluvial great soil group.

REGOSOLS

Regosols are an azonal group of soils having little or no horizon differentiation; they are deep (generally more than 2½ feet) over bedrock, are ordinarily nonstony, and consist of materials such as loess, marine and lacustrine sediments, and sand.

The Regosols in this county are members of the Lakeland, Eustis, Lakewood, Klej, Cuthbert, Barth, Huckabee, and Sunsweet series. Representative of Regosols in this county are the Lakeland soils. Following is a description of a Lakeland profile:

- A_1 0 to 4 inches, dark grayish-brown (10YR 4/2) loamy sand; loose; contains small amount of organic matter.
- A_{21} 4 to 16 inches, yellowish-brown (10YR 5/6) loamy sand; loose.
- A_{22} 16 to 42 inches, brownish-yellow (10YR 6/8) loamy sand; loose.

The Regosols in Escambia County have formed in thick beds of sands and loamy sands or thick beds of sandy clays and clays. The Lakeland, Eustis, Lakewood, Klej, Huckabee, and Barth soils are Regosols derived from coarse-textured materials; the Cuthbert and Sunsweet are from finer textured materials.

The Eustis soils are somewhat excessively drained and differ from the Lakeland primarily in having a yellowish-red subsoil. Lakewood soils have a layer of white sand between the surface soil and the brownish-yellow subsoil. The Klej soils are somewhat poorly drained. The Huckabee and Barth soils were derived from alluvial material and occur on stream terraces. Throughout their profile, the Cuthbert and Sunsweet soils contain more materials of fine texture.

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Glossary

Acidity. The degree of acidity of the soil mass expressed in pH values or in words as follows:

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5–5.0
Strongly acid	5.1–5.5
Medium acid	5.6–6.0
Slightly acid	6.1–6.5
Neutral	6.6–7.3
Mildly alkaline	7.4–7.8
Moderately alkaline	7.9–8.4
Strongly alkaline	8.5–9.0
Very strongly alkaline	9.1 and higher.

Aggregate, soil. A single mass or cluster consisting of many primary soil particles held together, such as a prism, crumb, or granule.

Alluvium. Sand, mud, or other sediments deposited on land by streams.

Bedrock. The solid rock underlying soils.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that contains 40 percent or more of clay, less than 45 percent of sand, and less than 40 percent of silt.

Concretions. Hard grains, pellets, or nodules resulting from concentrations of compounds that cement grains of soil together. The composition of some concretions is unlike that of surrounding soil material. Concretions are of various sizes, shapes, and colors. They commonly form where there are local accumulations of calcium carbonate, iron, and manganese oxides.

Consistence, soil. The combination of properties of soil material that determine its resistance to crushing and its ability to be molded or changed in shape. Soil consistence varies with moisture content, and terms have been established to define the consistence when the soil is wet, moist, and dry. Following are definitions for the terms most frequently used in this report:

Firm. When moist, soil material crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Friable. When moist, soil material crushes easily under gentle to moderate pressure between thumb and forefinger and coheres when pressed together.

Hard. When dry, soil material is moderately resistant to pressure, can be broken in hands without difficulty, but is barely breakable between thumb and forefinger.

Loose. Soil material is noncoherent when moist and when dry.

Plastic. When soil is wet, wire can be formed by rolling the soil between the hands, but moderate pressure is required to deform the soil mass.

Sticky. When wet, soil adheres to both thumb and forefinger after pressure and tends to stretch somewhat and to pull apart rather than pulling from either finger.

Very firm. When moist, soil material crushes under strong pressure; barely can be crushed between thumb and forefinger.

Very friable. When moist, soil material crushes under very gentle pressure but coheres when pressed together.

Cemented. When dry, and frequently when moist or wet, the material is brittle and hard. A *weakly cemented* mass can be broken in the hand. A *strongly cemented* mass cannot be broken in the hand but is easily broken with a hammer.

Contour tillage. Plowing or working the soil at right angles to the direction of slope, and at the same level throughout.

Cropland. Land regularly used for crops, except forest crops. It includes rotation pasture, cultivated summer fallow, or other land ordinarily used for crops but temporarily idle.

Drainage, soil. (1) The rapidity and extent of the removal of water from the soil by runoff and flow through the soil to underground spaces. (2) As a condition of the soil, soil drainage refers to the frequency and duration of periods when the soil is free of saturation. For example, in well-drained soils the water is removed readily, but not rapidly; in poorly drained soils, the root zone is waterlogged for long periods and the roots of ordinary crop plants cannot get enough oxygen; and in excessively drained soils, the water is removed so completely that most crop plants suffer from lack of water. *See* Infiltration, Internal drainage, Permeability, Runoff.

Erosion, soil. The wearing away or removal of soil material by water or wind. The two main types of erosion are *gully* erosion and *sheet* erosion. In *gully* erosion, water produces channels larger than rills. These channels form where the water is concentrated and carry water immediately after rains or when snow melts. *Sheet* erosion is the removal of a more or less uniform layer of soil material by overland flow of water. The eroding surface consists mainly of many small rills. In this report, degree of erosion is indicated in the soil name, as explained in the section, How Soils are Mapped and Described.

Fertility, soil. The inherent ability of a soil to provide proper compounds, in adequate amounts and proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and physical conditions of the soil are favorable.

First bottom. The normal flood plain of a stream; land along the stream subject to frequent or occasional flooding.

Genesis, soil. The mode of origin of the soil, particularly the processes responsible for the development of the solum, or true soil, from the unconsolidated parent material.

Great soil group. A broad group of soils having internal soil characteristics in common. A great soil group normally contains several soil series. *See* Series, Type, Phase.

Hardpan. A hardened or cemented soil horizon or layer. The soil material may be sandy or clayey. It may be cemented by iron oxide, silica, calcium carbonate, or other substances. Soils in Escambia County normally do not have a hardpan, but some do have an organic-matter stained pan layer.

Horizon, soil. A layer in the soil profile, approximately parallel to the land surface, and having well-defined characteristics.

A horizon. The upper horizon of the soil mass in which biological activity is maximum and from which material has been removed by percolating waters; the eluviated part of the solum; the surface soil. This horizon may be divided into two or more subhorizons, of which the A_0 is not a part of the mineral soil but the accumulation of organic debris on the surface. Other subhorizons are designated A_1, A_2, and so on.

B horizon. The soil horizon, usually beneath the A horizon, or surface soil, in which: (1) Clay, iron, or aluminum, with accessory organic matter, have accumulated; (2) the structure is blocky or prismatic; or (3) there is some combination of the features mentioned in 1 and 2. In soils with distinct profiles, the B horizon is roughly equivalent to the term "subsoil". This horizon may be divided into several subhorizons, depending on the color, structure, consistence, or character of the material. These layers are designated B_1, B_2, B_3, and so on. *See* Subsoil.

C horizon. The unconsolidated rock material in the lower part of the soil profile; the substratum; usually the parent material for the soil.

Infiltration. The downward movement of water into the soil.

Internal drainage. The rate of movement of water through the soil profile. It is affected by the texture and structure of the surface soil and subsoil, by other characteristics of the soil profile, and by the height of the ground-water table, either permanent or perched. Relative terms expressing internal drainage are *very rapid, rapid, medium, slow, very slow,* and *none.*

Leaching. The removal of material in solution by the passage of water through the soil.

Morphology, soil. The constitution of the soil, including the texture, structure, consistence, color, and other physical, chemical, and biological properties of the various soil horizons that make up the soil profile.

Mottling, soil. Irregular marking of soil horizons with spots of color. A common cause of mottling is imperfect or impeded drainage, although there are other causes, such as soil development from an unevenly weathered rock. Different kinds of minerals may cause mottling. Description of the mottling in soil horizons requires notations for abundance, size, and contrast. The terms for abundance are *few, common,* and *many*; for size, *fine, medium,* and *coarse*; and for contrast, *faint, distinct,* and *prominent.*

Normal soil. A soil having a profile in near equilibrium with its environment; developed under good but not excessive drainage from parent material of mixed mineral, physical, and chemical composition. In its characteristics the soil expresses the full effects of the forces of climate and living matter.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in elaboration of its food and tissue. These include nitrogen, phosphorus, calcium, potassium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps others obtained from the soil; and carbon, hydrogen, and oxygen, obtained largely from the air and water.

Parent material. The unconsolidated mass of rock material (or peat) from which the soil profile develops.

Peat. Unconsolidated soil material consisting largely of undecomposed or only slightly decomposed organic matter accumulated under conditions of excessive moisture.

Permeability, soil. That quality of a soil horizon that enables water or air to move through it. The permeability of a soil may be limited by the presence of one nearly impermeable horizon, even though the others are permeable. Terms used to express relative permeability are *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Phase, soil. The subdivision of a soil type having variations not significant to classification of the soil in its natural landscape but significant to the use and management of the soil. Examples of the variations recognized in soil phases are differences in slope, stoniness, and thickness because of accelerated erosion.

Productivity, soil. The present capability of a soil to produce a specified plant or sequence of plants under a defined set of management practices. It is measured in terms of the outputs, or harvests, in relation to the inputs of production factors for a specific kind of soil under a physically defined system of management.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction. *See* Acidity.

Relief. Elevations or inequalities of the land surface, considered collectively.

Runoff. The surface flow of water from an area. Runoff is affected by such factors as texture and structure of the surface soil, the vegetative covering, the prevailing climate, and the slope. Relative degrees of runoff are expressed as follows: *Very rapid, rapid, medium, slow, very slow,* and *ponded.*

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Usually sand grains consist chiefly of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more of sand and not more than 10 percent of clay.

Series, soil. A group of soils that, except for texture of the surface soil, are similar in profile characteristics and in arrangement of horizons. The soils of one series have developed from a particular type of parent material.

Silt. (1) Individual mineral particles of soil that range in diameter between the upper size of clay, 0.002 millimeter, and the lower size of very fine sand, 0.05 millimeter. (2) Soil of the textural class called silt contains 80 percent or more of silt and less than 12 percent of clay.

Slope, soil. Slope is expressed in percent, which equals the vertical distance, divided by the horizontal distance, times 100. The number of feet of fall per 100 feet of horizontal distance.

Soil. The natural medium for the growth of land plants. A soil is a natural, three-dimensional body on the surface of the earth, unlike the adjoining bodies.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soils includes the A and B horizons. Usually the characteristics of the material in these horizons are quite unlike those of the underlying parent material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Stratified. Composed of, or arranged in, strata, or layers, such as stratified alluvium. The term is normally confined to geological materials. Layers in soils that result from the processes of soil formation are normally called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from the adjoining aggregates. The principal forms of soil structure are *platy, prismatic, columnar, blocky,* and *granular.* Structure is defined in terms of distinctness, size, and shape of the soil aggregates. For example, "moderate medium subangular blocky" means moderately distinct, medium-sized aggregates of subangular blocky shape.

Subsoil. The B horizons of soils with distinct profiles. In soils with weak profile development the subsoil can be defined as the soil below plow depth in which roots grow. Although a common term, subsoil cannot be defined accurately. It has been carried over from early days when *soil* was conceived to be only the plowed part of the profile and all material underneath was called *subsoil.*

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness.

Terrace. (1) AGRICULTURAL: A broad channel or embankment constructed across sloping lands, at or approximately on a contour line. Terraces are spaced at regular intervals on a slope so as to intercept and control runoff. They check runoff so that more water will infiltrate, and they carry surplus water to an outlet at a velocity that will not erode the soil. (2) GEOLOGIC: A flat or undulating plain, commonly rather narrow and usually with a steep front, that borders a river, lake, or the sea. Many old terraces have become more or less hilly through dissection by streams, but they are still regarded as terraces.

Tilth, soil. The physical condition of a soil in respect to its fitness for the growth of a specified plant or sequence of plants. *Good* and *bad* tilth are terms for the general structural condition of cultivated soils. Ideal soil tilth is not the same for all crops, nor is it uniform for a given crop planted on different soils.

Topsoil. Presumably fertile soil material used to dress roadbanks, gardens, and lawns.

Type, soil. A group of soils, within a given soil series, that have the same texture in the surface soil; have the same arrangement of horizons; and have the same parent material. A soil type may be subdivided into several soil phases.

Upland, geologic. Land consisting of material that has not been worked by water in recent geologic time. In a general sense, the term "upland" means high ground; ground elevated above the lowlands along the rivers or the lowlands between hills.

Water table. The upper limit of the part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

SOIL SERIES OF ESCAMBIA COUNTY, FLORIDA:

Series and undifferentiated units	Topographic position	Parent material [1]	Dominant slope range [2]		Drainage	
			Description	Percent	Surface runoff	Internal
Angie	Narrow upland ridges	Sandy clays and clays.	Very gently sloping.	2–5	Medium	Slow
Barth	Stream terraces	Alluvium washed from upland soils.	Level to nearly level.	0–2	Slow [5]	Slow [6] to medium.
Blakely	Slightly depressed areas on smooth interstream ridges.	Sandy loams to sandy clays.	Nearly level	0–2	Medium to slow.	Medium
Carnegie	Broad ridgetops and adjacent slopes.	Sandy clay loams and sandy clays.	Level to gently sloping.	0–8	Medium to rapid.	Medium
Eustis	Narrow ridges and slopes to streams and drainageways.	Sands and loamy sands.	Level to sloping	0–12	Slow [5] to rapid.	Rapid
Faceville	Smooth interstream ridges.	Sandy clay loams and sandy clays.	Level to very gently sloping.	0–5	Medium	Medium to slow.
Grady	Periodically ponded depressions within smooth interstream ridges.	Sandy clays and clays.	Level	0–2	Ponded	Very slow
Huckabee	Stream terraces	Alluvium washed from upland soils.	Level to very gently sloping.	0–5	Slow [5] to medium.	Rapid
Irvington	Smooth interstream ridges.	Sandy clay loams and sandy clays.	Nearly level	0–2	Slow	Slow
Izagora	Stream terraces	Alluvium washed from upland soils.	Level	0–2	Medium to slow.	Slow to medium.
Kalmia	Stream terraces	Alluvium washed from upland soils.	Level to very gently sloping.	0–5	Medium to rapid.	Medium
Klej	Low ridges within broad wet areas.	Sands and loamy sands.	Level to very gently sloping.	0–5	Slow [5]	Slow [6] to medium.
Lakeland	Broad ridges and slopes to streams and drainageways.	Sands and loamy sands.	Level to sloping	0–12	Slow [5] to rapid.	Rapid
Lakeland, Ruston, and Norfolk soils.	Sloping areas adjacent to streams and drainageways.	Sands, loamy sands, and sandy loams to sandy clays.	Very gently sloping to strongly sloping.	2–17	Medium to rapid.	Slow to rapid
Lakewood	Low sand ridges adjacent to coast.	Sands and loamy sands.	Level to very gently sloping.	0–5	Slow [5]	Rapid
Leon	Low ridges within broad wet areas.	Sands and loamy sands.	Level to nearly level.	0–2	Slow [5]	Slow [6]
Lynchburg	Gentle slopes to streams and drainageways.	Sandy loams to sandy clays.	Level to very gently sloping.	0–5	Slow to medium.	Slow [6] to medium.
Myatt	Stream terraces	Alluvium washed from upland soils.	Level to very gently sloping.	0–5	Slow to medium.	Very slow [6]

See footnotes at end of table.

SUMMARY OF IMPORTANT CHARACTERISTICS

Surface soil [3]				Subsoil		
Color [4]	Texture	Consistence	Thickness	Color [4]	Texture	Consistence (when moist)
			Inches			
Grayish brown to light yellowish brown.	Fine sandy loam.	Friable.	8–12	Yellow, with mottled red and gray.	Fine sandy clay loam.	Firm.
Very dark gray to light olive brown.	Loamy fine sand.	Very friable.	8–12	Light yellowish brown to pale yellow.	Loamy fine sand.	Very friable.
Dark reddish brown.	Loam.	Friable.	10–15	Red.	Fine sandy clay loam.	Friable to firm.
Dark brown to dark gray.	Fine sandy loam.	Friable.	8–12	Yellowish red to red.	Fine sandy clay loam.	Friable to firm.
Dark brown to dark grayish brown.	Loamy fine sand, loamy sand, or sand.	Loose to very friable.	6–10	Yellowish brown to reddish yellow.	Loamy fine sand, loamy sand, or sand.	Loose to very friable.
Dark grayish brown to yellowish brown.	Fine sandy loam.	Friable.	8–12	Yellowish red.	Fine sandy clay loam.	Friable to firm.
Dark gray.	Loam.	Friable.	4–8	Gray mottled with brownish yellow and red.	Silty clay.	Firm.
Dark grayish brown to yellowish brown.	Loamy fine sand.	Very friable.	8–12	Brownish yellow.	Loamy fine sand.	Very friable.
Very dark grayish brown to yellowish brown.	Fine sandy loam.	Friable.	8–12	Yellow mottled with pale yellow and strong brown.	Fine sandy clay loam.	Firm.
Dark grayish brown to yellowish brown.	Fine sandy loam.	Friable.	8–12	Brownish yellow mottled with red, light gray, yellowish red, and strong brown.	Fine sandy clay loam to sandy clay.	Firm to very firm.
Dark grayish brown to yellowish brown.	Fine sandy loam.	Friable.	8–12	Brownish yellow to yellow mottled with yellowish brown and yellowish red.	Fine sandy clay loam.	Friable.
Dark gray to black.	Sand or loamy sand.	Loose to very friable.	8–10	Brownish yellow to yellowish brown mottled with yellowish red, strong brown, and yellow.	Sand to loamy sand.	Loose to very friable.
Dark grayish brown to yellowish brown.	Loamy fine sand, loamy sand, or sand.	Loose to very friable.	6–10	Yellow to brownish yellow.	Loamy fine sand, loamy sand, or sand.	Very friable to loose.
Very dark grayish brown or grayish brown to yellowish brown.	Loamy fine sand or fine sandy loam.	Very friable to friable.	2–12	Yellow, brownish yellow, strong brown, or reddish yellow to yellowish red.	Loamy fine sand to fine sandy clay.	Very friable to friable.
Light gray.	Sand.	Loose.	4–6	White to brownish yellow.	Sand.	Loose.
Very dark gray to white.	Sand.	Loose.	4–8	White, dark reddish brown, or dark brown to yellow mottled with reddish yellow and pale brown.[7]	Sand [7].	Strongly cemented.[7]
Very dark gray or black to light yellowish brown.	Very fine sandy loam or fine sandy loam.	Friable.	10–12	Brownish yellow or yellowish brown to light yellowish brown mottled with gray, strong brown, and yellow.	Fine sandy clay loam.	Friable to firm.
Dark gray or gray to light brownish gray.	Loamy fine sand or very fine sandy loam.	Very friable to friable.	8–12	Gray to light gray or light grayish brown to grayish brown mottled with light yellow, brownish yellow, pale brown, reddish yellow, and strong brown.	Loamy fine sand or fine sandy clay loam.	Very friable to friable.

SOIL SERIES OF ESCAMBIA COUNTY, FLORIDA:

Series and undifferentiated units	Topographic position	Parent material [1]	Dominant slope range [2]		Drainage	
			Description	Percent	Surface runoff	Internal
Norfolk	Smooth interstream ridges.	Sandy loams to sandy clays.	Level to gently sloping.	0–8	Medium to rapid.	Medium
Pamlico	Ponded areas adjacent to streams and drainageways.	Sands, loamy sands, and plant remains.	Level	0–2	Ponded	Very slow [6]
Plummer	Seepage and periodically ponded areas.	Sands and loamy sands.	Level to very gently sloping.	0–5	Very slow [5] to medium.	Very slow [6]
Portsmouth	Periodically ponded depressions within smooth interstream ridges.	Sandy clays and clays.	Level	0–2	Ponded	Very slow
Portsmouth, Grady, and Bayboro soils.	Periodically ponded depressions within smooth interstream ridges.	Sandy clays and clays.	Level	0–2	Ponded	Very slow [6]
Red Bay	Smooth interstream ridges.	Sandy loams to sandy clays.	Level to gently sloping.	0–8	Medium to rapid.	Medium
Ruston	Smooth interstream ridges.	Sandy loams to sandy clays.	Level to gently sloping.	0–8	Medium to rapid.	Medium
Rutlege	Broad low wet areas	Sands and loamy sands.	Nearly level	0–2	Slow to very slow. [5]	Very slow [6]
Savannah	Smooth interstream ridges.	Sandy clay loams and sandy clays.	Level to very gently sloping.	0–5	Medium	Medium to slow.
Stough	Stream terraces	Alluvium washed from upland soils.	Nearly level	0–2	Slow	Slow to medium.
Sunsweet, Carnegie, and Cuthbert soils.	Sloping areas adjacent to streams and drainageways.	Sandy clay loams, sandy clays, and clays.	Very gently sloping to sloping.	2–12	Rapid	Medium to slow.
Tifton	Smooth interstream ridges.	Sandy clay loams and sandy clays.	Level to gently sloping.	0–8	Medium to rapid.	Medium
Wahee	Stream terraces	Alluvium washed from upland soils.	Level to nearly level.	0–2	Slow	Very slow

[1] All materials from beds of Coastal Plain sediments.

[2] Slope-range classification established for this report is described in the section, How Soils Are Mapped and Described.

[3] Refers to the upper layers of the A horizon which normally contain the greatest amount of organic matter, roots, and available plant nutrients.

SUMMARY OF IMPORTANT CHARACTERISTICS—Continued

Surface soil [3]				Subsoil		
Color [4]	Texture	Consistence	Thickness	Color [4]	Texture	Consistence (when moist)
			Inches			
Grayish brown to yellowish brown.	Fine sandy loam.	Friable	10–14	Brownish yellow mottled with reddish yellow.	Fine sandy clay loam.	Friable.
Black	Muck	Sticky [8]	24–30	Black	Mucky sand	Sticky.[8]
Dark gray to gray	Loamy sand, fine sand, or sand.	Loose to very friable.	4–8	Light gray to grayish brown; may be mottled with strong brown.	Loamy sand, fine sand, or sand.	Loose to very friable.
Black	Loam	Friable	12–16	Very dark grayish brown to light grayish brown mottled with brownish yellow, strong brown, and gray.	Fine sandy clay loam.	Firm.
Very dark gray or dark grayish brown to black.	Fine sandy loam to fine sandy clay.	Friable	10–16	Dark grayish brown mottled with brownish yellow.	Fine sandy clay or fine sandy clay loam.	Firm.
Dark reddish brown or dark grayish brown to yellowish red.	Fine sandy loam or loamy fine sand.	Friable to very friable.	10–14	Red to yellowish red	Fine sandy clay loam or fine sandy loam.	Firm to friable.
Very dark grayish brown to yellowish brown.	Fine sandy loam or loamy fine sand.	Friable to very friable.	10–14	Yellowish red or reddish yellow to strong brown.	Fine sandy clay loam or fine sandy loam.	Friable.
Black	Sand	Very friable	10–14	Dark gray to light brownish gray.	Sand	Very friable to loose.
Dark grayish brown to brownish yellow.	Fine sandy loam	Friable	8–12	Brownish yellow mottled with dark brown, pale yellow, and red.	Fine sandy clay loam.	Firm.
Dark gray to grayish brown.	Fine sandy loam	Friable	8–12	Brownish yellow to light yellowish brown mottled with yellow, strong brown, and light gray.	Fine sandy clay loam.	Friable.
Dark grayish brown, dark brown, or yellowish brown to yellowish red.	Fine sandy loam	Friable	3–12	Brownish yellow, reddish yellow, yellowish red, or red mottled with strong brown, gray, and red.	Fine sandy clay loam to fine sandy clay.	Friable to firm.
Dark gray to brownish yellow.	Fine sandy loam	Friable	10–14	Brownish yellow mottled with strong brown and reddish yellow.	Fine sandy clay loam to fine sandy clay.	Friable to firm.
Dark grayish brown to light olive brown.	Very fine sandy loam.	Friable	6–10	Light yellowish brown mottled with yellowish red, yellow, light brownish gray, and red.	Silty clay loam to clay.	Firm.

[4] Color of moist soil unless otherwise noted.
[5] Because of rapid infiltration and low relief.
[6] Because of high water table.
[7] Organic hardpan.
[8] When wet.

GUIDE TO MAPPING UNITS

Map symbol	Soil name	Described on page —	Capability unit	Described on page —
Aa	Angie fine sandy loam, very gently sloping phase	7	IIe–3	43
Ba	Barth loamy fine sand	9	IIIs–2	46
Bb	Blakely loam	9	I–1	42
Ca	Carnegie fine sandy loam, level phase	10	I–2	43
Cb	Carnegie fine sandy loam, very gently sloping phase	10	IIe–2	43
Cc	Carnegie fine sandy loam, eroded very gently sloping phase	10	IIe–2	43
Cd	Carnegie fine sandy loam, gently sloping phase	10	IIIe–2	45
Ce	Carnegie fine sandy loam, eroded gently sloping phase	11	IIIe–2	45
Cf	Coastal dune land and beach	11	VIII–1	51
Ea	Eustis loamy fine sand, level phase	11	IIs–1	44
Eb	Eustis loamy fine sand, very gently sloping phase	11	IIIs–1	45
Ec	Eustis loamy fine sand, gently sloping phase	12	IVs–1	47
Ed	Eustis loamy fine sand, sloping phase	12	VIe–2	49
Ee	Eustis loamy sand, level phase	12	IIs–1	44
Ef	Eustis loamy sand, very gently sloping phase	12	IIIs–1	45
Eg	Eustis loamy sand, gently sloping phase	12	IVs–1	47
Eh	Eustis loamy sand, sloping phase	13	VIe–2	49
Ek	Eustis sand, level phase	13	IVs–2	48
Em	Eustis sand, very gently sloping phase	13	IVs–2	48
En	Eustis sand, sloping phase	13	VIIs–1	50
Fa	Faceville fine sandy loam, level phase	13	I–2	43
Fb	Faceville fine sandy loam, very gently sloping phase	14	IIe–2	43
Fc	Fresh water swamp	14	(1)	50
Ga	Grady loam	14	Vw–1	48
Gb	Gullied land	15	VIIe–2	50
Ha	Huckabee loamy fine sand, level phase	15	IIs–1	44
Hb	Huckabee loamy fine sand, very gently sloping phase	16	IIIs–1	45
Ia	Irvington fine sandy loam	16	IIw–1	44
Ib	Izagora fine sandy loam	17	IIw–1	44
Ka	Kalmia fine sandy loam, level phase	17	I–1	42
Kb	Kalmia fine sandy loam, very gently sloping phase	17	IIe–1	43
Kc	Klej loamy sand, level phase	18	IIIs–2	46
Kd	Klej loamy sand, very gently sloping phase	18	IIIs–2	46
Ke	Klej sand, level phase	18	IIIs–2	46
Kf	Klej sand, very gently sloping phase	19	IIIs–2	46
La	Lakeland loamy fine sand, level phase	19	IIs–1	44
Lb	Lakeland loamy fine sand, very gently sloping phase	20	IIIs–1	45
Lc	Lakeland loamy fine sand, gently sloping phase	20	IVs–1	48
Ld	Lakeland loamy fine sand, sloping phase	20	VIe–2	49
Le	Lakeland loamy sand, level phase	20	IIs–1	44
Lf	Lakeland loamy sand, very gently sloping phase	20	IIIs–1	45
Lg	Lakeland loamy sand, gently sloping phase	20	IVs–1	48
Lh	Lakeland loamy sand, sloping phase	21	VIe–2	49
Lj	Lakeland sand, level phase	21	IVs–2	48
Lk	Lakeland sand, very gently sloping phase	21	IVs–2	48
Ll	Lakeland sand, gently sloping phase	21	IVs–2	48
Lm	Lakeland sand, sloping phase	21	VIIs–1	50
Ln	Lakeland, Ruston, and Norfolk soils, very gently sloping phases	22	IIIs–1	45
Lo	Lakeland, Ruston, and Norfolk soils, gently sloping phases	22	IVe–1	47
Lp	Lakeland, Ruston, and Norfolk soils, eroded gently sloping phases	22	IVe–1	47
Lr	Lakeland, Ruston, and Norfolk soils, eroded sloping phases	22	VIe–2	49
Ls	Lakeland, Ruston, and Norfolk soils, eroded strongly sloping phases	22	VIIe–1	50
Lt	Lakewood sand, level phase	23	VIIs–2	50
Lu	Lakewood sand, very gently sloping phase	23	VIIs–2	50
Lv	Leon sand	23	Vs–1	49
Lw	Leon sand, light colored surface phase	24	Vs–1	49
Ly	Lynchburg fine sandy loam, level phase	24	IIIw–1	46
Lz	Lynchburg fine sandy loam, very gently sloping phase	24	IIIw–1	46
Lx	Lynchburg gravelly very fine sandy loam	24	IIIw–1	46
Ma	Mixed alluvial land, poorly drained	25	(1)	50
Mb	Mixed local alluvial land, moderately well drained	25	(1)	50
Mc	Myatt loamy fine sand, thick surface phase	26	Vw–1	48
Md	Myatt very fine sandy loam, level phase	25	Vw–1	48
Me	Myatt very fine sandy loam, very gently sloping phase	26	Vw–1	48
Na	Norfolk fine sandy loam, level phase	26	I–1	42
Nb	Norfolk fine sandy loam, very gently sloping phase	27	IIe–1	43
Nc	Norfolk fine sandy loam, gently sloping phase	27	IIIe–1	45
Pa	Pamlico muck	27	IIIw–2	47
Pb	Pits, dumps, and made land	28	(1)	50
Pc	Plummer fine sand	28	Vw–1	48
Pd	Plummer loamy sand, level phase	28	Vw–1	48
Pe	Plummer loamy sand, very gently sloping phase	28	Vw–1	48

See footnote at end of table.

GUIDE TO MAPPING UNITS—Continued

Map symbol	Soil name	Described on page —	Capability unit	Described on page —
Pf	Plummer sand	29	Vw–1	48
Pg	Portsmouth loam	29	IIIw–2	47
Ph	Portsmouth, Grady, and Bayboro soils	29	Vw–1	48
Ra	Red Bay fine sandy loam, level phase	30	I–1	42
Rb	Red Bay fine sandy loam, very gently sloping phase	30	IIe–1	43
Rc	Red Bay fine sandy loam, gently sloping phase	30	IIIe–1	45
Rd	Red Bay loamy fine sand, level thick surface phase	31	IIs–1	44
Re	Red Bay loamy fine sand, very gently sloping thick surface phase	31	IIIs–1	45
Rf	Red Bay loamy fine sand, gently sloping thick surface phase	31	IVs–1	48
Rg	Rough broken land	32	VIIe–2	50
Rh	Ruston fine sandy loam, level phase	32	I–1	42
Rk	Ruston fine sandy loam, very gently sloping phase	32	IIe–1	43
Rm	Ruston fine sandy loam, gently sloping phase	32	IIIe–1	45
Rn	Ruston loamy fine sand, level thick surface phase	33	IIs–1	44
Ro	Ruston loamy fine sand, very gently sloping thick surface phase	33	IIIs–1	45
Rp	Ruston loamy fine sand, gently sloping thick surface phase	33	IVs–1	48
Rs	Rutlege sand	34	IIIw–2	47
Sa	Savannah fine sandy loam, level thick solum phase	34	IIw–1	44
Sb	Savannah fine sandy loam, very gently sloping thick solum phase	34	IIe–3	43
Sc	Stough fine sandy loam	35	IIIw–1	46
Sd	Sunsweet, Carnegie, and Cuthbert soils, very gently sloping phases	35	VIe–1	49
Se	Sunsweet, Carnegie, and Cuthbert soils, gently sloping phases	36	VIe–1	49
Sf	Sunsweet, Carnegie, and Cuthbert soils, eroded sloping phases	36	VIIe–1	50
Sg	Sunsweet, Carnegie, and Cuthbert soils, severely eroded sloping phases	36	VIIe–1	50
Ta	Tidal marsh	36	VIII–1	51
Tb	Tifton fine sandy loam, level phase	36	I–2	43
Tc	Tifton fine sandy loam, very gently sloping phase	37	IIe–2	43
Td	Tifton fine sandy loam, gently sloping phase	37	IIIe–2	45
Wa	Wahee very fine sandy loam	38	Vw–1	48

[1] Miscellaneous land type; not assigned to a capability unit.

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SOIL ASSOCIATION MAP
ESCAMBIA COUNTY, FLORIDA

1 0 1 2 3 4 Miles

N

LEGEND

NEARLY LEVEL TO GENTLY SLOPING SOILS ON UPLANDS

1. Dark reddish-brown loams and sandy loams; red subsoils; well drained: Red Bay-Blakely
2. Dark-gray sandy loams; mottled subsoils; well drained to somewhat poorly drained: Tifton-Irvington-Lynchburg
3. Grayish-brown sandy loams; yellowish subsoils; well drained or moderately well drained: Norfolk-Ruston-Savannah
4. Dark-gray sandy loams; slightly compact subsoils; well drained: Tifton-Carnegie-Faceville
5. Gray sands; very sandy subsoils; somewhat excessively drained: Lakeland-Eustis
9. Light-gray sands; sandy subsoils; excessively drained or somewhat excessively drained: Lakewood-Lakeland

SLOPING TO STEEP SOILS ON UPLANDS

10. Undifferentiated soils: Lakeland, Ruston and Norfolk-Sunsweet, Carnegie, and Cuthbert

NEARLY LEVEL SOILS OF RIVER TERRACES, DEPRESSIONS, AND LOWLANDS

6. Gray sandy soils on lowlands; somewhat poorly drained; moderately high water table: Klej-Leon
7. Gray or very dark gray fine sands; poorly drained: Plummer-Rutlege
8. Sandy soils on river terraces; well drained or moderately well drained: Huckabee-Kalmia-Izagora
11. Undifferentiated coastal soils bordering salt water: Coastal dune land and beach-Tidal marsh
12. Undifferentiated poorly drained flood plains and swamps: Mixed alluvial land-Fresh water swamp

INDEX TO MAP SHEETS
ESCAMBIA COUNTY, FLORIDA

1 0 1 2 3 4 Miles

N

ESCAMBIA COUNTY
ALABAMA
R. 34 W. 87°35′ R. 33 W. 87°30′ R. 32 W. 87°25′ R. 31 W. 87°20′ R. 30 W. 87°15′ R. 29 W. 87°10′
31°00′
30°55′
30°50′
30°45′
30°40′
30°35′
30°30′
30°25′
30°20′
T. 5 N.
T. 4 N.
T. 3 N.
T. 2 N.
T. 1 N.
T. 1 S.
T. 2 S.
T. 3 S.
Bratt
CENTURY
ROSA
SANTA ROSA COUNTY
Bluff Springs
Walnut Hill
McDavid
Bogia
McKinnonville
Bay Springs
Pine Barren
Barth
MOLINO
Barrineau Park
Quintette
Cottage Hill
CANTONMENT
Muscogee
Gonzalez
ENSLEY
Ferry Pass
Olive
PENSACOLA
Myrtle Grove
Pleasant Grove
Gulf Beach
Santa Rosa Island
Inset Sheet No. 70
Inset Sheet No. 71
Inset Sheet No. 72
OKALOOSA COUNTY
ST LOUIS & LOUISVILLE & NASHVILLE
SAN FRANCISCO & NASHVILLE
LOUISVILLE & NASHVILLE
PERDIDO
BALDWIN
ESCAMBIA
BAY
SOUND
GULF OF MEXICO

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Roads

- Good motor
- Poor motor
- Trail
- Marker, U. S. (33)

Railroads

- Single track
- Multiple track
- Abandoned

Bridges and crossings

- Road
- Trail, foot
- Railroad
- Ferry
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings

- School
- Church
- Station

Mine and Quarry

- Shaft
- Dump
- Prospect

Pits, gravel or other

Power line

Pipeline

Cemetery

Dam

Levee

Tank

Oil well

Windmill

Canal lock (point upstream)

BOUNDARIES

- National or state
- County
- Township, civil
- Township, U. S.
- Section line, corner
- City (corporate)
- Reservation
- Land grant

DRAINAGE

Streams

- Perennial
- Intermittent, unclass.
- Crossable with tillage implements
- Not crossable with tillage implements

Canals and ditches (CANAL, DITCH)

Lakes and ponds

- Perennial
- Intermittent

Wells (flowing)

Springs

Marsh

Wet spot

RELIEF

Escarpments

- Bedrock
- Other

Prominent peaks

Depressions

	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

- Soil type outline and symbol (Dx)
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land

Erosion

- Uneroded spot — U
- Sheet, moderate — S
- Sheet, severe — SS
- Gully, moderate — G
- Gully, severe — GG
- Sheet and gully, moderate — SG
- Wind, moderate
- Wind, severe
- Blowout
- Wind hummock
- Overblown soil

Gullies

Areas of alkali and salts

- Strong (A)
- Moderate (M)
- Slight (S)

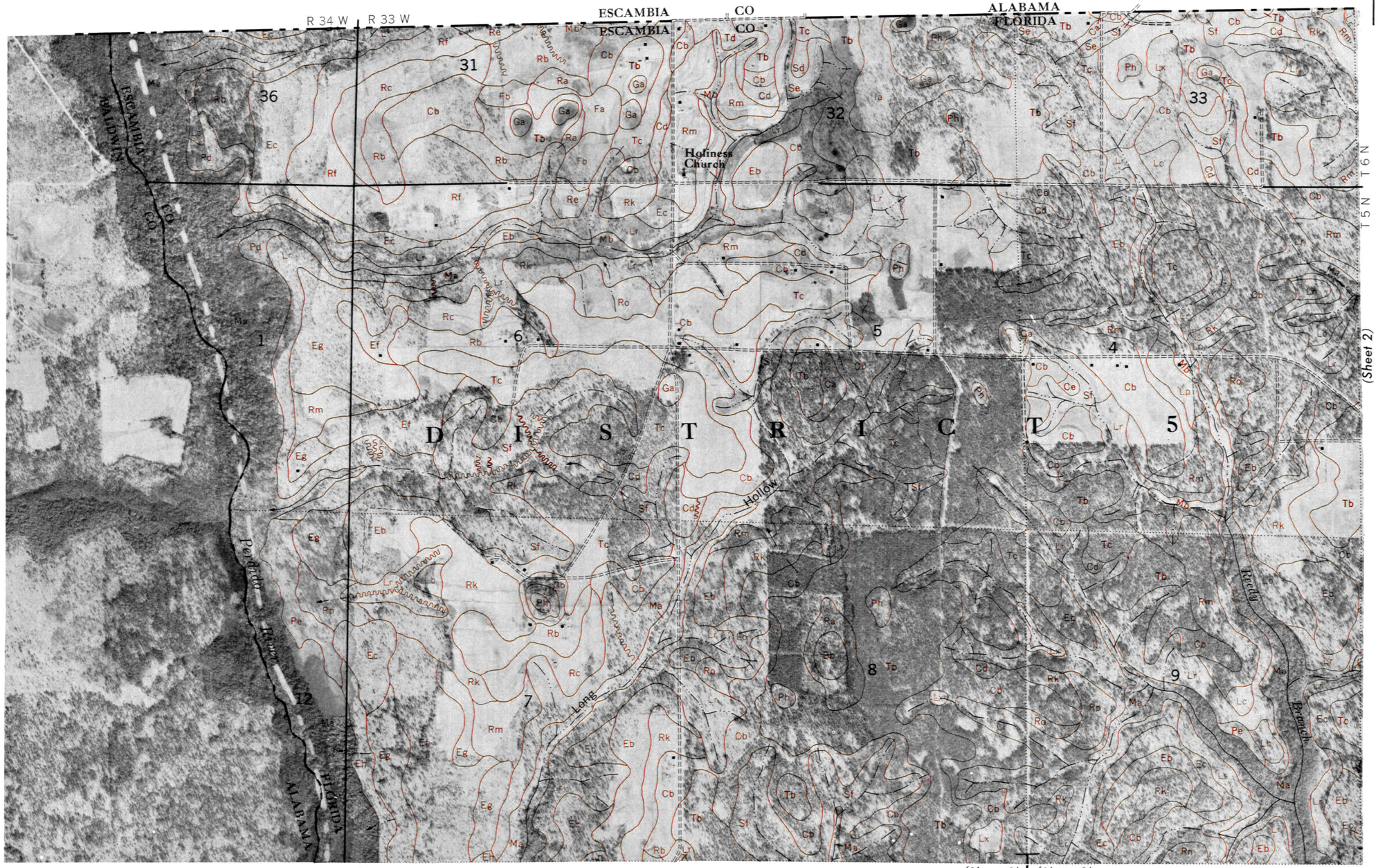
- Free of toxic effect — F
- Sample location — 26
- Saline spot

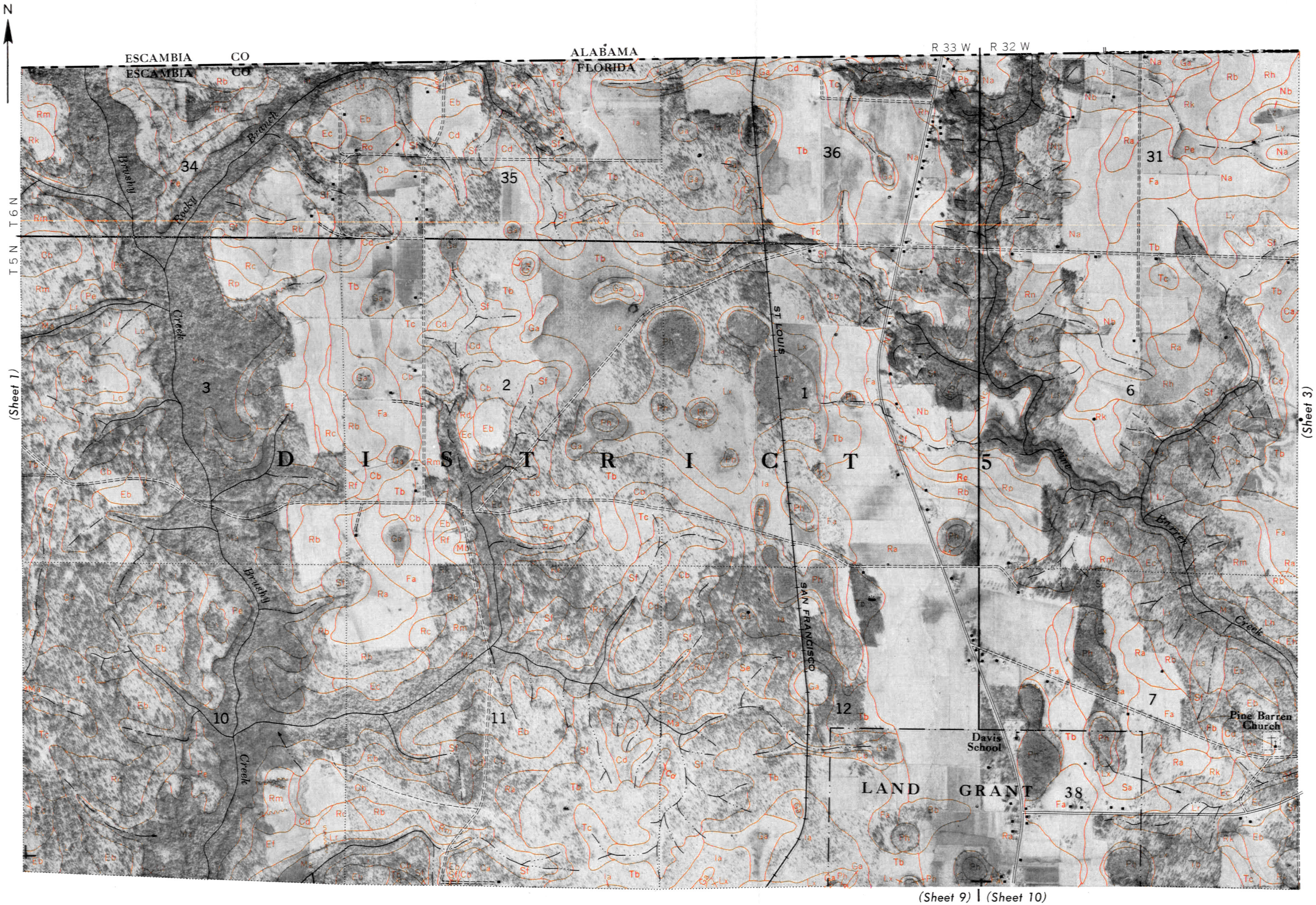
SOILS LEGEND

SYMBOL	NAME
Aa	Angie fine sandy loam, very gently sloping phase
Ba	Barth loamy fine sand
Bb	Blakely loam
Ca	Carnegie fine sandy loam, level phase
Cb	Carnegie fine sandy loam, very gently sloping phase
Cc	Carnegie fine sandy loam, eroded very gently sloping phase
Cd	Carnegie fine sandy loam, gently sloping phase
Ce	Carnegie fine sandy loam, eroded gently sloping phase
Cf	Coastal dune land and beach
Ea	Eustis loamy fine sand, level phase
Eb	Eustis loamy fine sand, very gently sloping phase
Ec	Eustis loamy fine sand, gently sloping phase
Ed	Eustis loamy fine sand, sloping phase
Ee	Eustis loamy sand, level phase
Ef	Eustis loamy sand, very gently sloping phase
Eg	Eustis loamy sand, gently sloping phase
Eh	Eustis loamy sand, sloping phase
Ek	Eustis sand, level phase
Em	Eustis sand, very gently sloping phase
En	Eustis sand, sloping phase
Fa	Faceville fine sandy loam, level phase
Fb	Faceville fine sandy loam, very gently sloping phase
Fc	Fresh water swamp
Ga	Grady loam
Gb	Gullied land
Ha	Huckabee loamy fine sand, level phase
Hb	Huckabee loamy fine sand, very gently sloping phase
Ia	Irvington fine sandy loam
Ib	Izagora fine sandy loam
Ka	Kalmia fine sandy loam, level phase
Kb	Kalmia fine sandy loam, very gently sloping phase
Kc	Klej loamy sand, level phase
Kd	Klej loamy sand, very gently sloping phase
Ke	Klej sand, level phase
Kf	Klej sand, very gently sloping phase
La	Lakeland loamy fine sand, level phase
Lb	Lakeland loamy fine sand, very gently sloping phase
Lc	Lakeland loamy fine sand, gently sloping phase
Ld	Lakeland loamy fine sand, sloping phase
Le	Lakeland loamy sand, level phase
Lf	Lakeland loamy sand, very gently sloping phase
Lg	Lakeland loamy sand, gently sloping phase
Lh	Lakeland loamy sand, sloping phase
Lj	Lakeland sand, level phase
Lk	Lakeland sand, very gently sloping phase
Ll	Lakeland sand, gently sloping phase
Lm	Lakeland sand, sloping phase
Ln	Lakeland, Ruston, and Norfolk soils, very gently sloping phases
Lo	Lakeland, Ruston, and Norfolk soils, gently sloping phases
Lp	Lakeland, Ruston, and Norfolk soils, eroded gently sloping phases
Lr	Lakeland, Ruston, and Norfolk soils, eroded sloping phases
Ls	Lakeland, Ruston, and Norfolk soils, eroded strongly sloping phases
Lt	Lakewood sand, level phase
Lu	Lakewood sand, very gently sloping phase
Lv	Leon sand
Lw	Leon sand, light colored surface phase
Lx	Lynchburg gravelly very fine sandy loam
Ly	Lynchburg fine sandy loam, level phase
Lz	Lynchburg fine sandy loam, very gently sloping phase
Ma	Mixed alluvial land, poorly drained
Mb	Mixed local alluvial land, moderately well drained
Mc	Myatt loamy fine sand, thick surface phase
Md	Myatt very fine sandy loam, level phase
Me	Myatt very fine sandy loam, very gently sloping phase
Na	Norfolk fine sandy loam, level phase
Nb	Norfolk fine sandy loam, very gently sloping phase
Nc	Norfolk fine sandy loam, gently sloping phase
Pa	Pamlico muck
Pb	Pits, dumps, and made land
Pc	Plummer fine sand
Pd	Plummer loamy sand, level phase
Pe	Plummer loamy sand, very gently sloping phase
Pf	Plummer sand
Pg	Portsmouth loam
Ph	Portsmouth, Grady, and Bayboro soils
Ra	Red Bay fine sandy loam, level phase
Rb	Red Bay fine sandy loam, very gently sloping phase
Rc	Red Bay fine sandy loam, gently sloping phase
Rd	Red Bay loamy fine sand, level thick surface phase
Re	Red Bay loamy fine sand, very gently sloping thick surface phase
Rf	Red Bay loamy fine sand, gently sloping thick surface phase
Rg	Rough broken land
Rh	Ruston fine sandy loam, level phase
Rk	Ruston fine sandy loam, very gently sloping phase
Rm	Ruston fine sandy loam, gently sloping phase
Rn	Ruston loamy fine sand, level thick surface phase
Ro	Ruston loamy fine sand, very gently sloping thick surface phase
Rp	Ruston loamy fine sand, gently sloping thick surface phase
Rs	Rutlege sand
Sa	Savannah fine sandy loam, level thick solum phase
Sb	Savannah fine sandy loam, very gently sloping thick solum phase
Sc	Stough fine sandy loam
Sd	Sunsweet, Carnegie, and Cuthbert soils, very gently sloping phases
Se	Sunsweet, Carnegie, and Cuthbert soils, gently sloping phases
Sf	Sunsweet, Carnegie, and Cuthbert soils, eroded sloping phases
Sg	Sunsweet, Carnegie, and Cuthbert soils, severely eroded sloping phases
Ta	Tidal marsh
Tb	Tifton fine sandy loam, level phase
Tc	Tifton fine sandy loam, very gently sloping phase
Td	Tifton fine sandy loam, gently sloping phase
Wa	Wahee very fine sandy loam

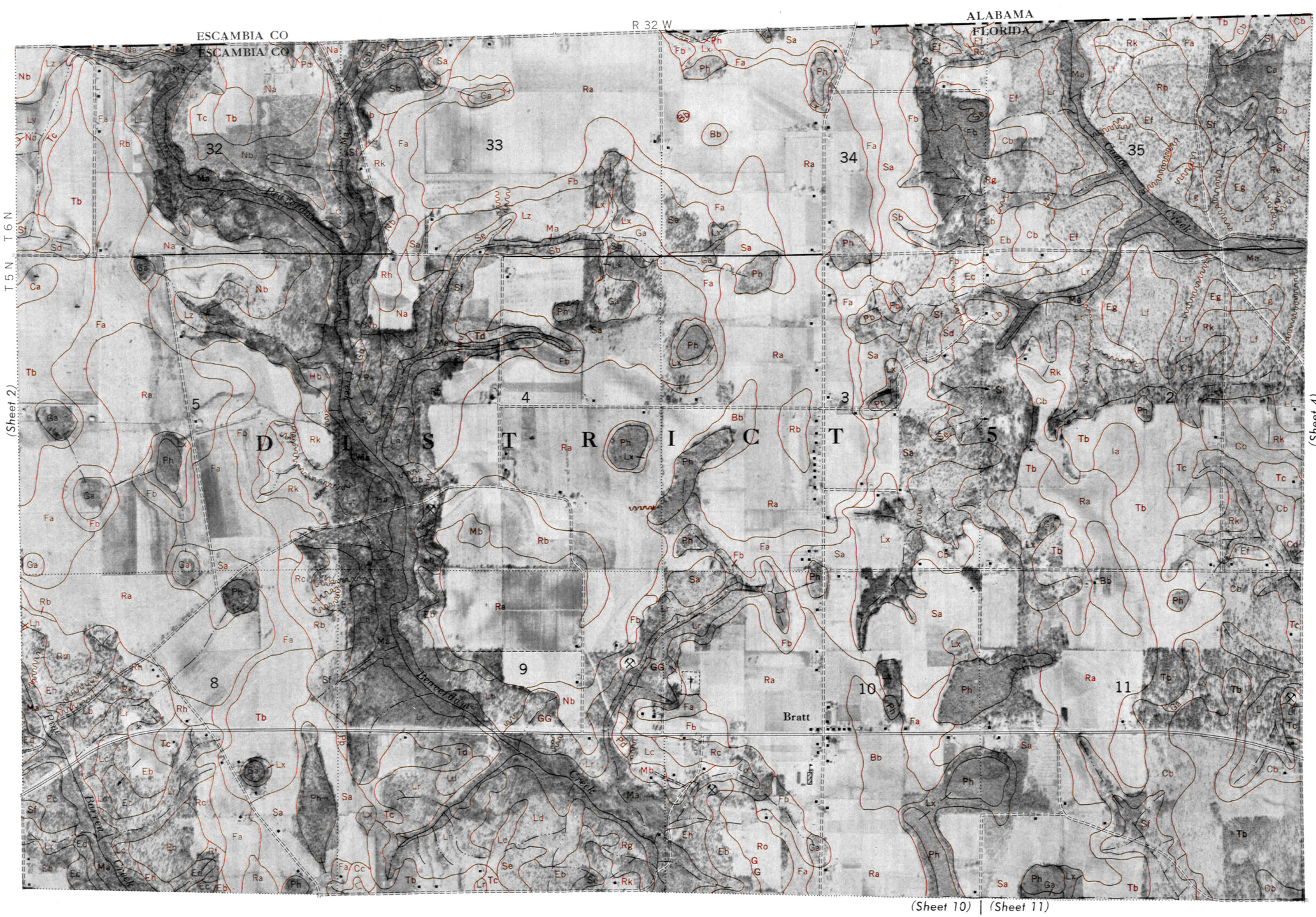
Soils surveyed 1950-55 by J. H. Walker and V. W. Carlisle, Florida Agricultural Experiment Station.
Correlation by A. H. Hasty, Soil Conservation Service.

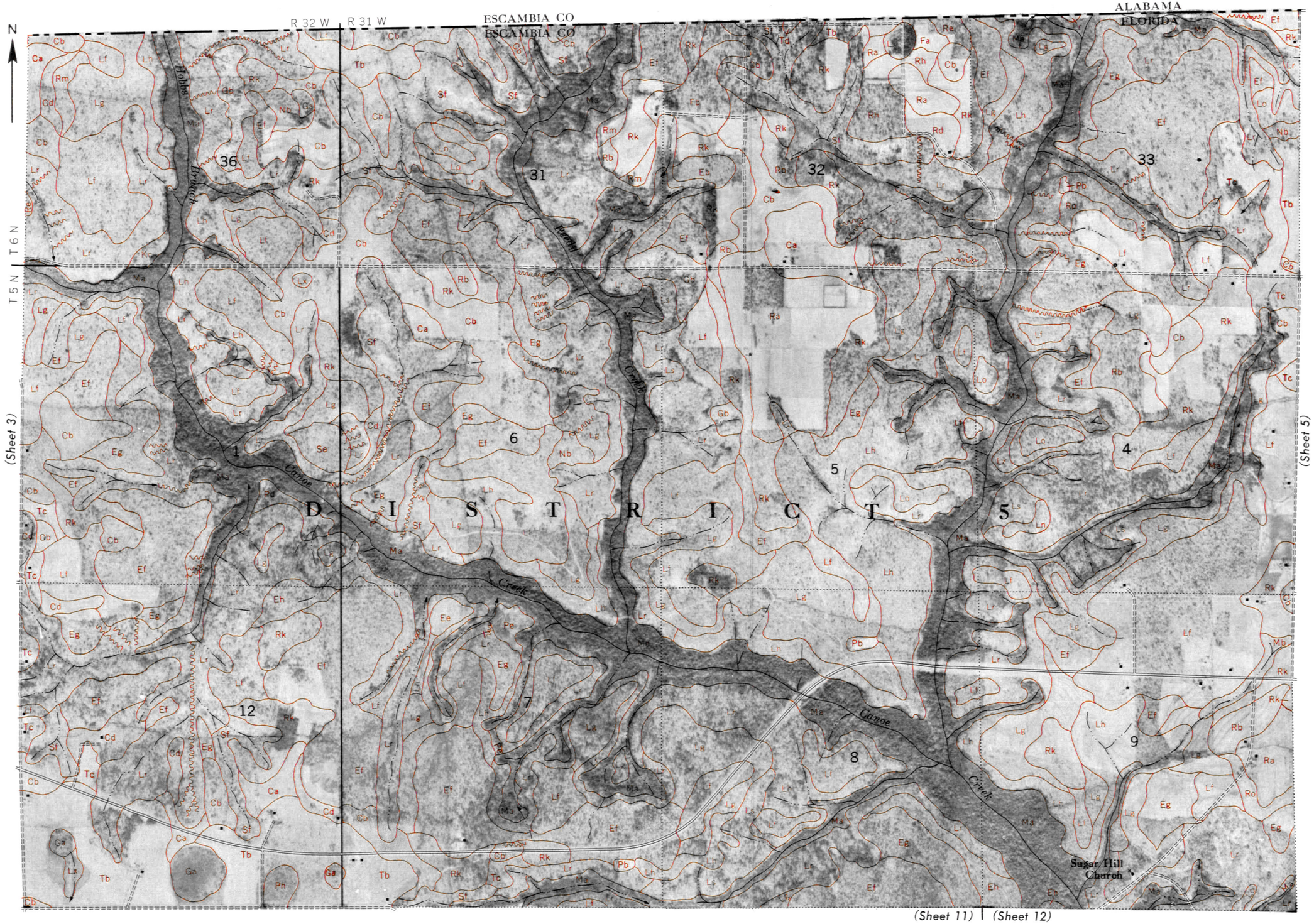
Soil map constructed 1957 by Cartographic Division, Soil Conservation Service, USDA, from 1951 aerial photographs. Controlled mosaic based on Florida plane coordinate system, north zone, Lambert conformal conic projection, 1927 North American datum.





0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

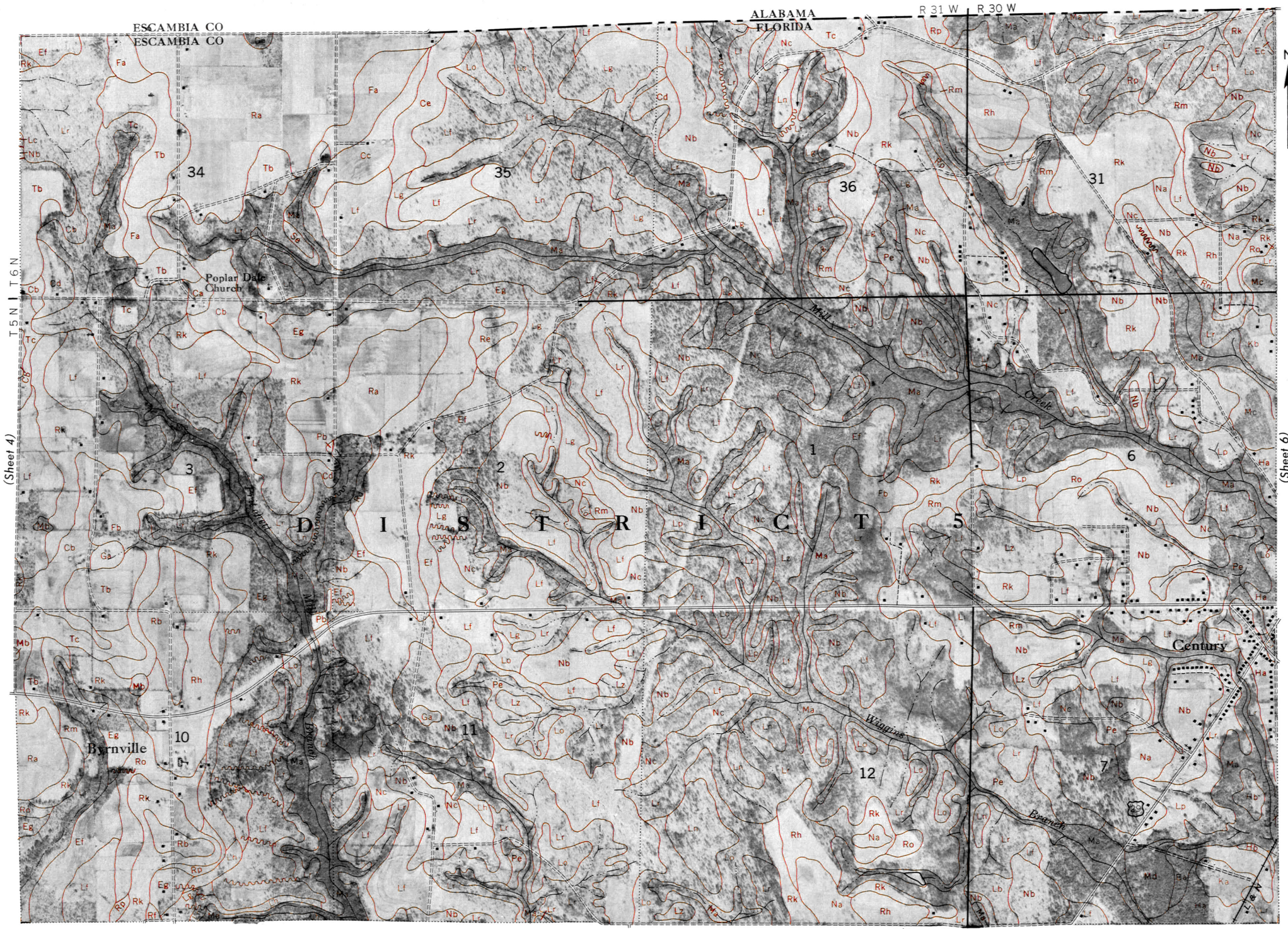

N
ESCAMBIA CO
ESCAMBIA CO
ALABAMA
FLORIDA
R 32 W
T 6 N
T 5 N
DISTRICT 5
32
33
34
35
5
4
3
2
8
9
10
11
Bratt
Perdido River
Burnt Corn Creek
Beaverdam Creek
Pine Barren Creek
Burnt Corn Creek
Creek
(Sheet 2)
(Sheet 4)
(Sheet 10)
(Sheet 11)
0
1/2
1 Mile
Scale 1:20000
0
5000 Feet



0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

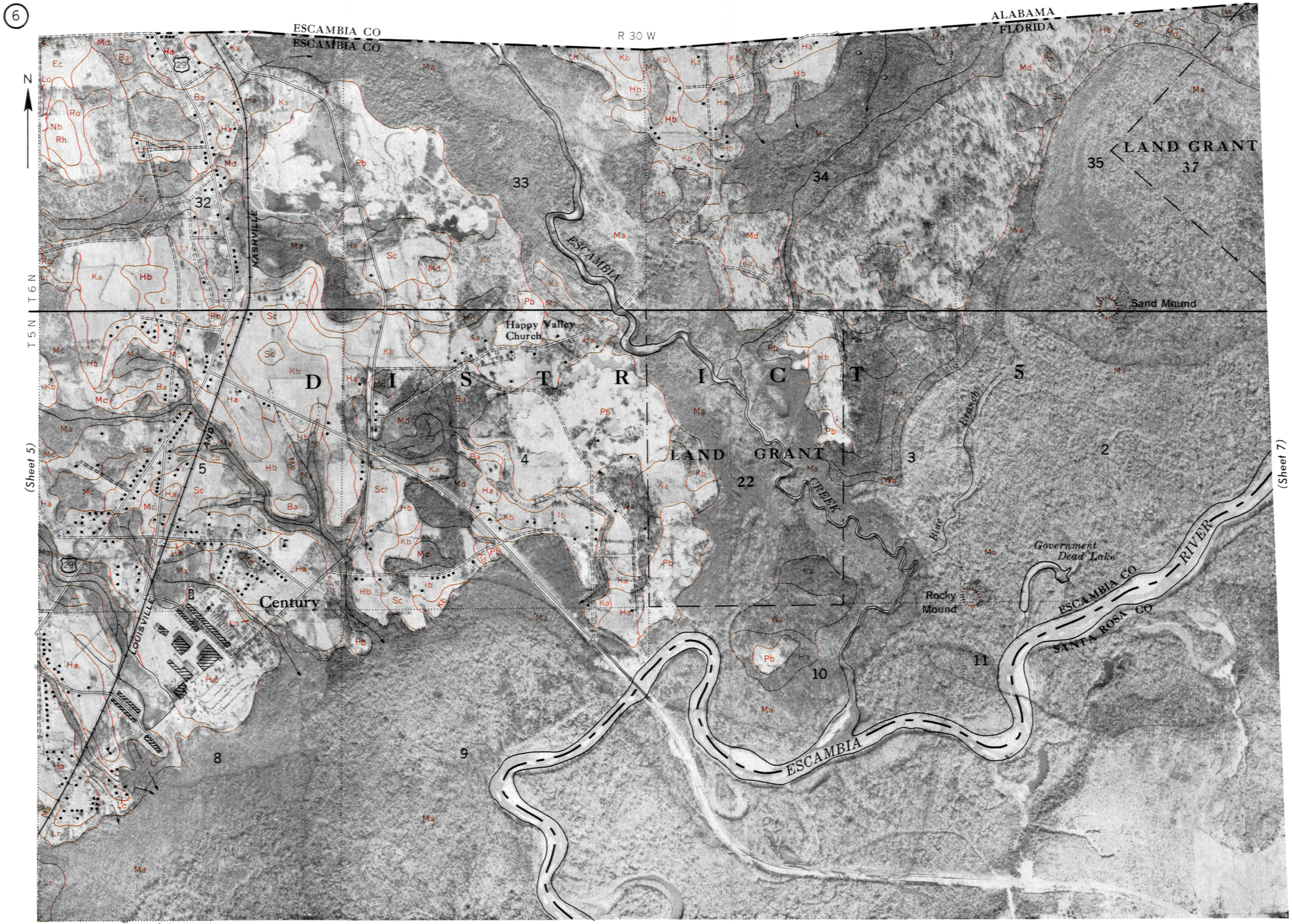


0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

6


ESCAMBIA CO
ESCAMBIA CO
R 30 W
ALABAMA
FLORIDA
N
T 6 N
T 5 N
NASHVILLE
ESCAMBIA
33
34
35
LAND GRANT
37
32
Sand Mound
Happy Valley Church
DISTRICT
5
4
3
2
LAND GRANT
22
Blue Creek
Government Dead Lake
ESCAMBIA CO
SANTA ROSA CO
RIVER
Rocky Mound
11
10
LOUISVILLE
Century
8
9
ESCAMBIA
(Sheet 5)
(Sheet 7)
(Sheet 13)
0
½
1 Mile
Scale 1:20 000
0
5000 Feet

ESCAMBIA COUNTY, FLORIDA

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

7

N

ESCAMBIA COUNTY, FLORIDA

8

(Sheet 1)

R 34 W | R 33 W

N

ALABAMA
FLORIDA

Perdido River

Hurlburt Creek

Long Hollow

BALDWIN CO
ESCAMBIA CO

13 18 17 24 19 20 25 30 29 26

DISTRICT 5

T 5 N

(Sheet 9)

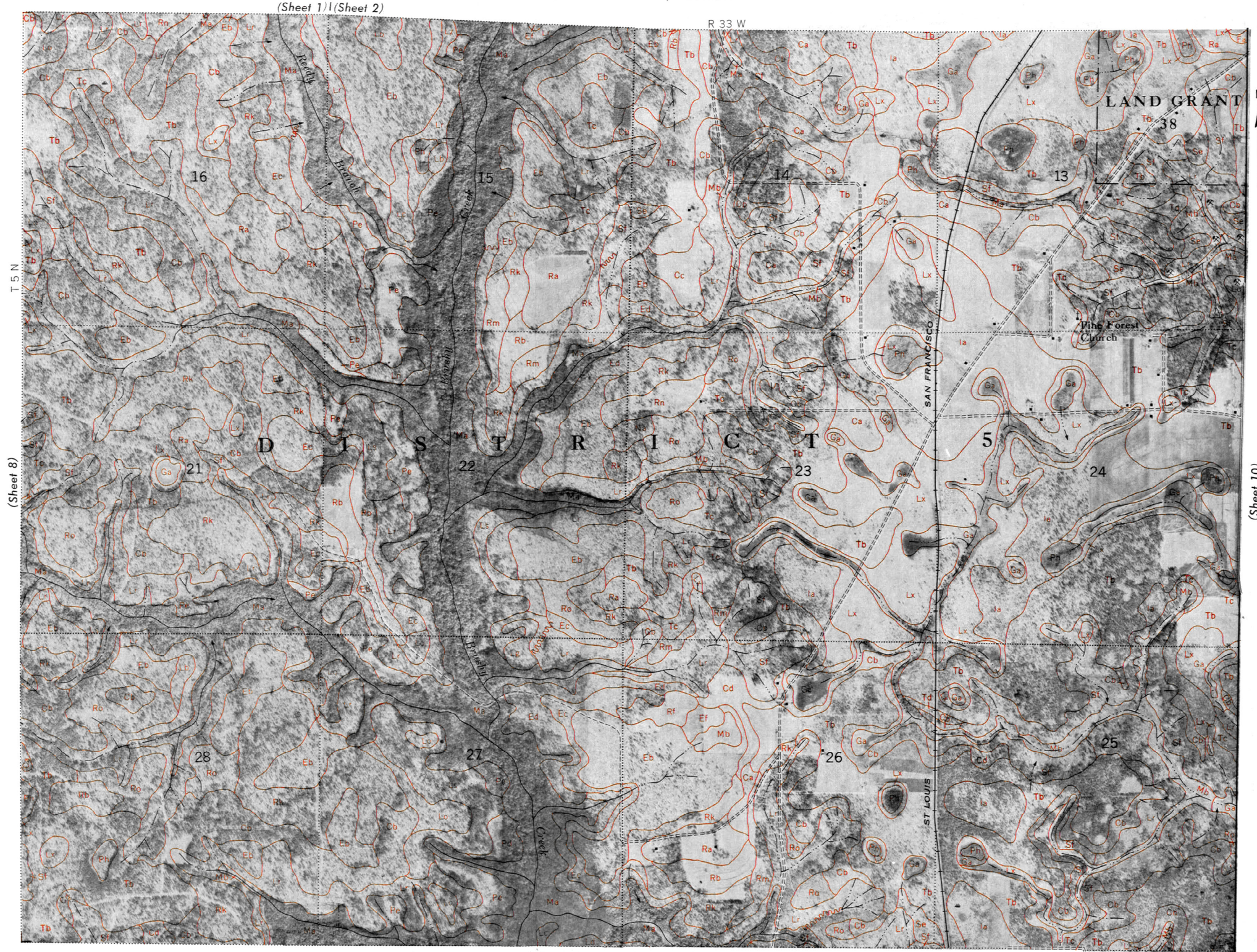
(Sheet 14)

0 1/2 1 Mile

Scale 1:20000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA



(Sheet 2) | (Sheet 3)

10

R 32 W

N

T 5 N

LAND GRANT

38

18

17

16

15

19

20

21

22

30

29

28

27

5

D I S T R I C T

Little Sandy Hollow

Sandy Hollow

Sandy Hollow

Pine Barren Creek

Pine Barren Creek

Pine Barren Creek

Pine Barren Creek

Hall Br

Shiloh Church

Oak Grove School

Union Church

(Sheet 9)

(Sheet 11)

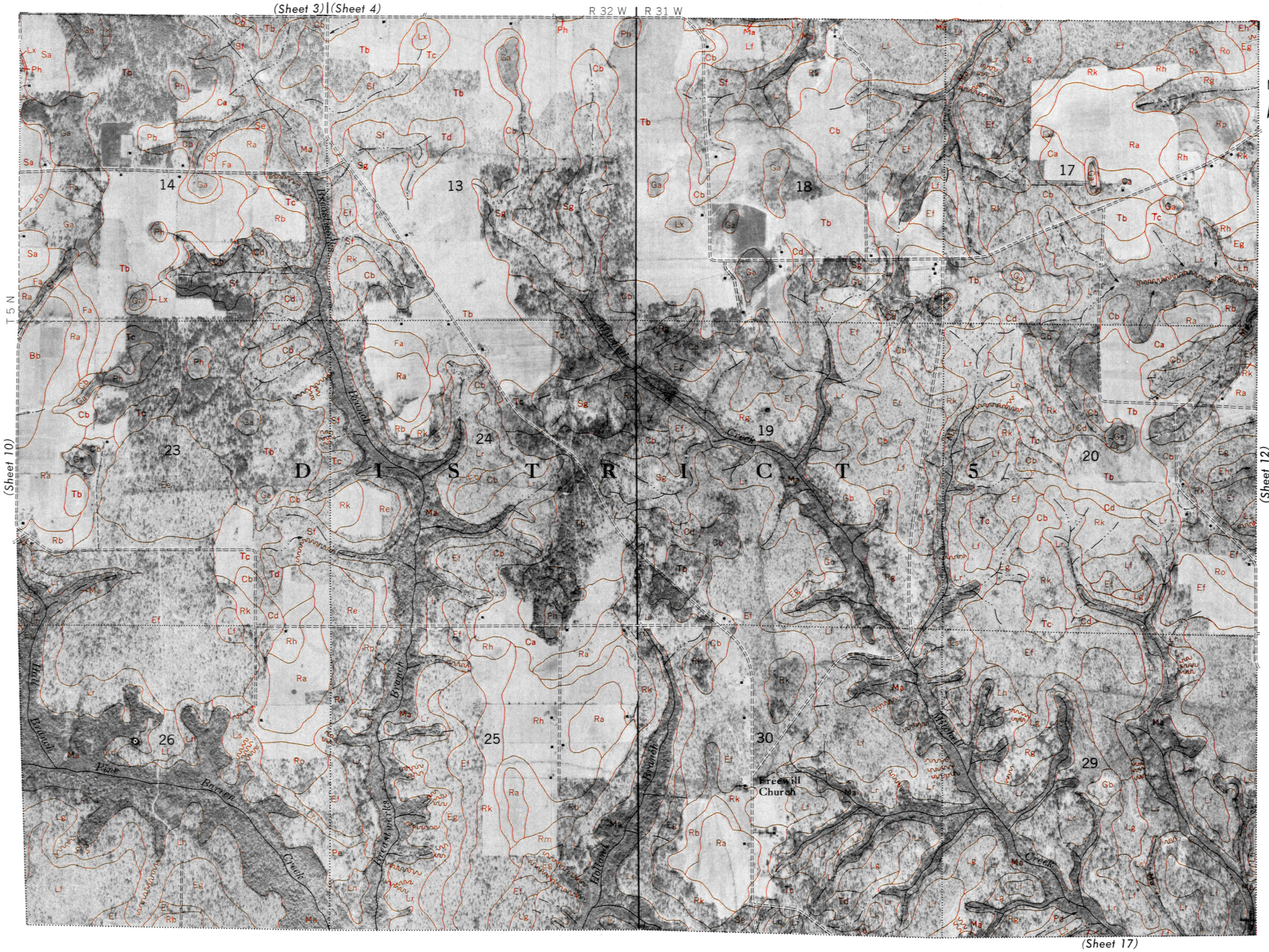
(Sheet 16)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA



0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

12

R 31 W

(Sheet 4) | (Sheet 5)

N

T 5 N

(Sheet 11)

(Sheet 13)

(Sheet 18)

16 15 14 13

21 22 23 24

28 27 26 25

38 37

DISTRICT 5

LAND GRANT

LAND GRANT

Bluff Springs

Carrine Creek

Pritchett

Mill

Branch

Creek

Carrine Creek

Creek

NASHVILLE AND LOUISVILLE

SANTA ROSA CO

SANTA ROSA CO

ESCAMBIA R

29

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

R 30 W

N

T 5 N

DISTRICT 5

16 17 18 19 20 30

NASHVILLE

LOUISVILLE

IND

Salters Lake

ESCAMBIA RIVER

ESCAMBIA CO

SANTA ROSA CO

ESCAMBIA

Bluff Springs

29

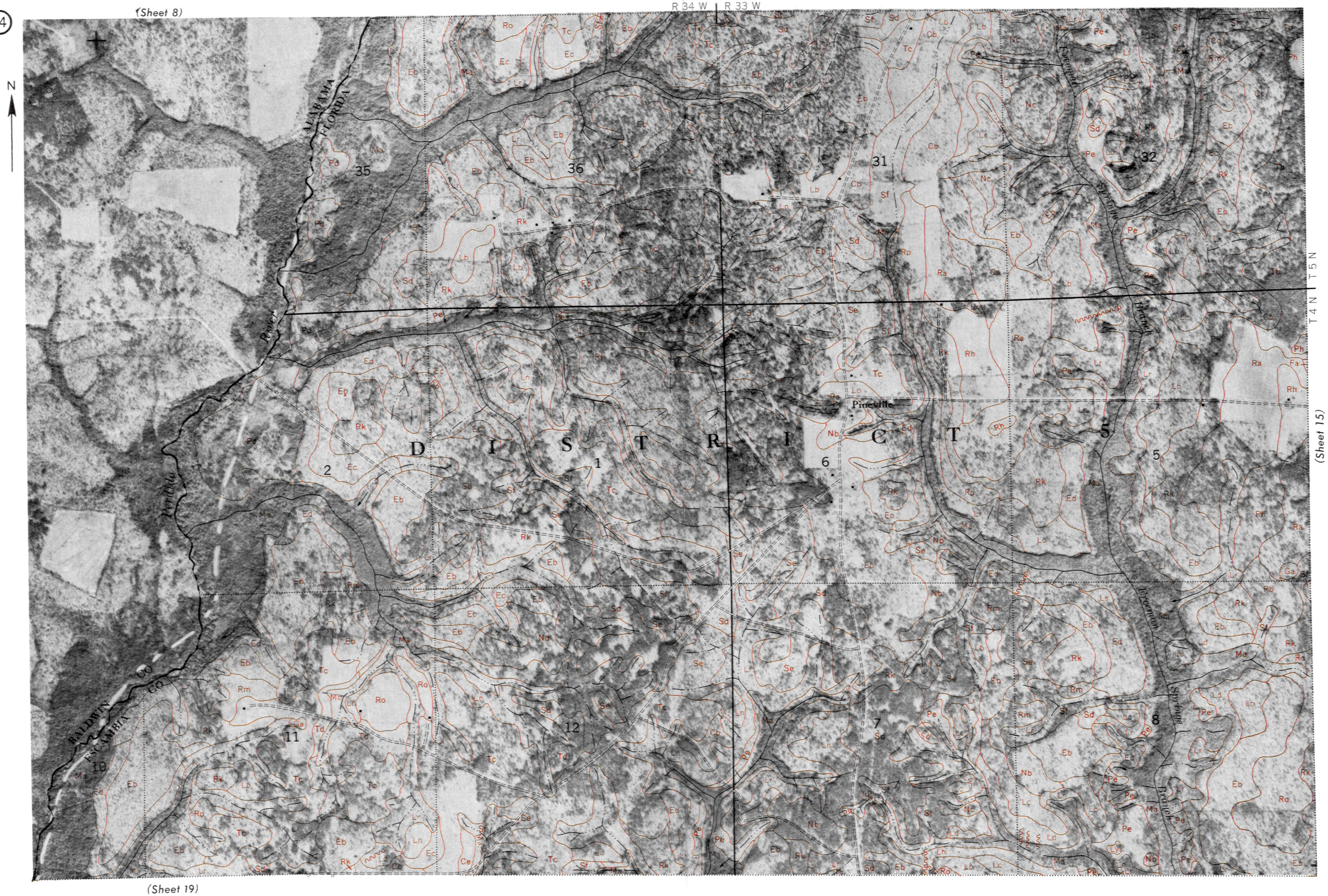
Ma Lb Nb Lf Hb Lr Ha Ba Ka Kb Wa He Md Ib Pb

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

14



Scale 1:20 000

0 ½ 1 Mile

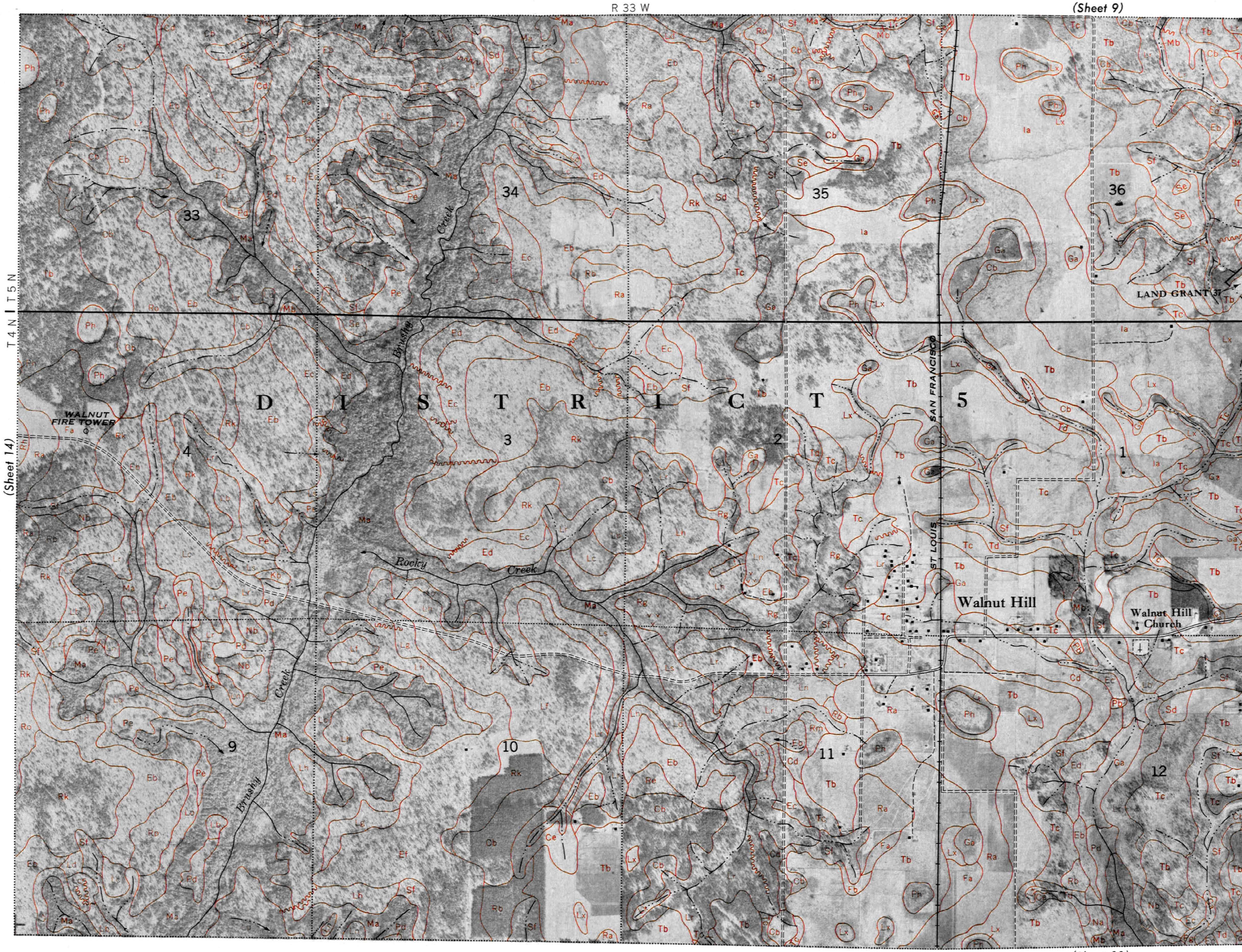
0 5000 Feet

R 33 W

(Sheet 9)

T 5 N
T 4 N

(Sheet 14)



(Sheet 16)

(Sheet 20)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

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16

(Sheet 10)

R 32 W

N

T 4 N | T 5 N

(Sheet 15)

(Sheet 17)

(Sheet 21)

LAND GRANT

DISTRICT

31 32 33 34 37 5 4 3 6 7 8 9 10

Barnest Ward School

Walnut Hill Church

Little Pine Barren Creek

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

ESCAMBIA COUNTY, FLORIDA

R 32 W | R 31 W

(Sheet 11)

17

N

T 4 N | T 5 N

(Sheet 16)

(Sheet 18)

(Sheet 22)

DISTRICT 5

Scale 1:20 000

0 ½ 1 Mile

0 5000 Feet

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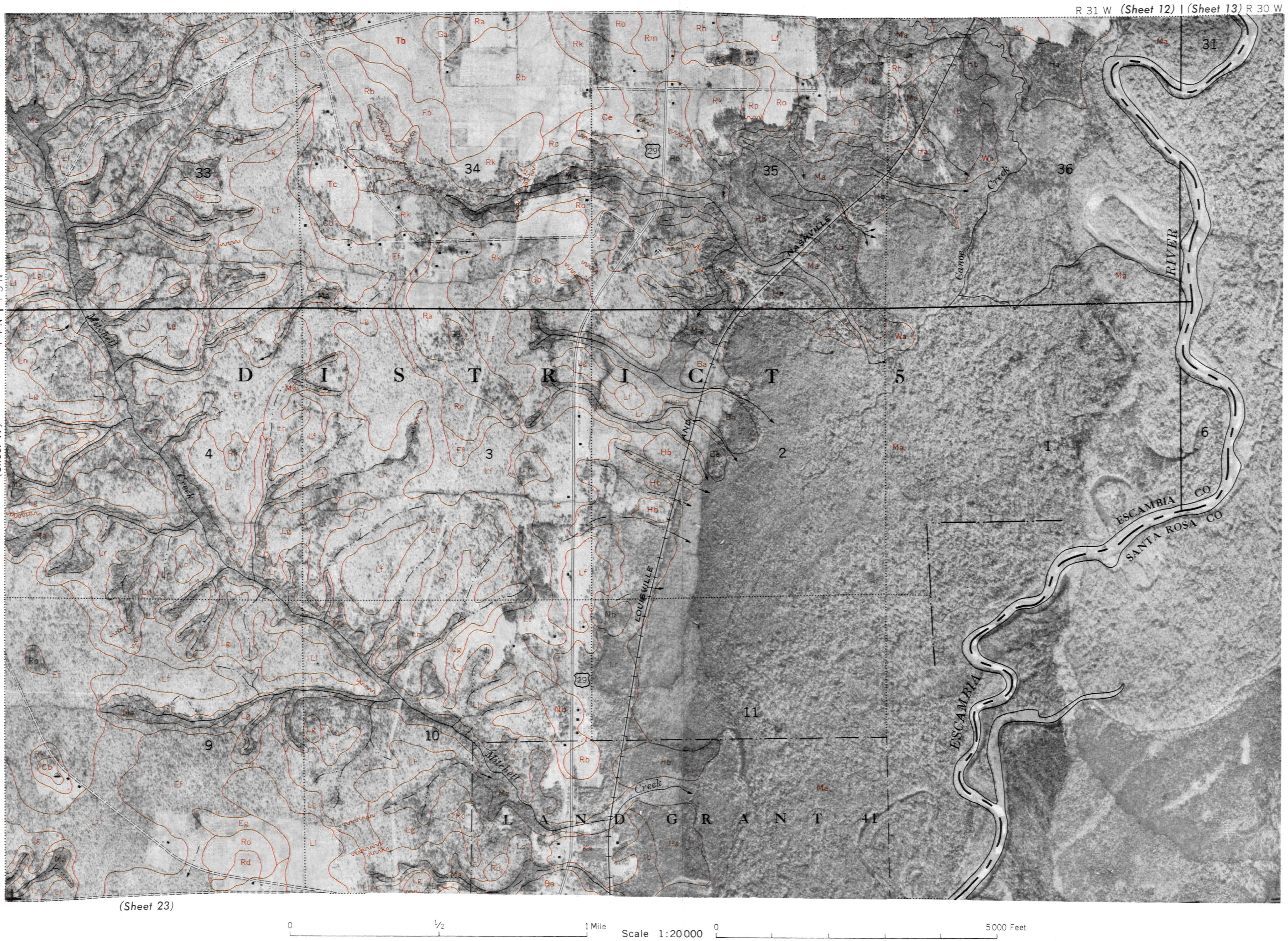
18


R 31 W
(Sheet 12)
(Sheet 13)
R 30 W
N
T 5 N
T 4 N
(Sheet 17)
(Sheet 23)
31
33
34
35
36
29
NASHVILLE
Canoe
Creek
RIVER
D I S T R I C T 5
Mitchell
Creek
4
3
2
1
6
AND
LOUISVILLE
ESCAMBIA CO
SANTA ROSA CO
ESCAMBIA
9
10
11
Mitchell
Creek
L A N D G R A N T 41
0
1/2
1 Mile
Scale 1:20 000
0
5000 Feet

ESCAMBIA COUNTY, FLORIDA

R 34 W | R 33 W

(Sheet 14)

19

N

T 4 N

(Sheet 20)

(Sheet 24)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

(Sheet 15)

R 33 W

20

N

T 4 N

16 15 14 13

21 22 23 24

28 27 26 25

5

D I S T R I C T

Brushy Creek

Brushy Creek

Buckeye Branch

Narrow Gap Branch

Rogers Creek

ST LOUIS & SAN FRANCISCO

(Sheet 19)

(Sheet 21)

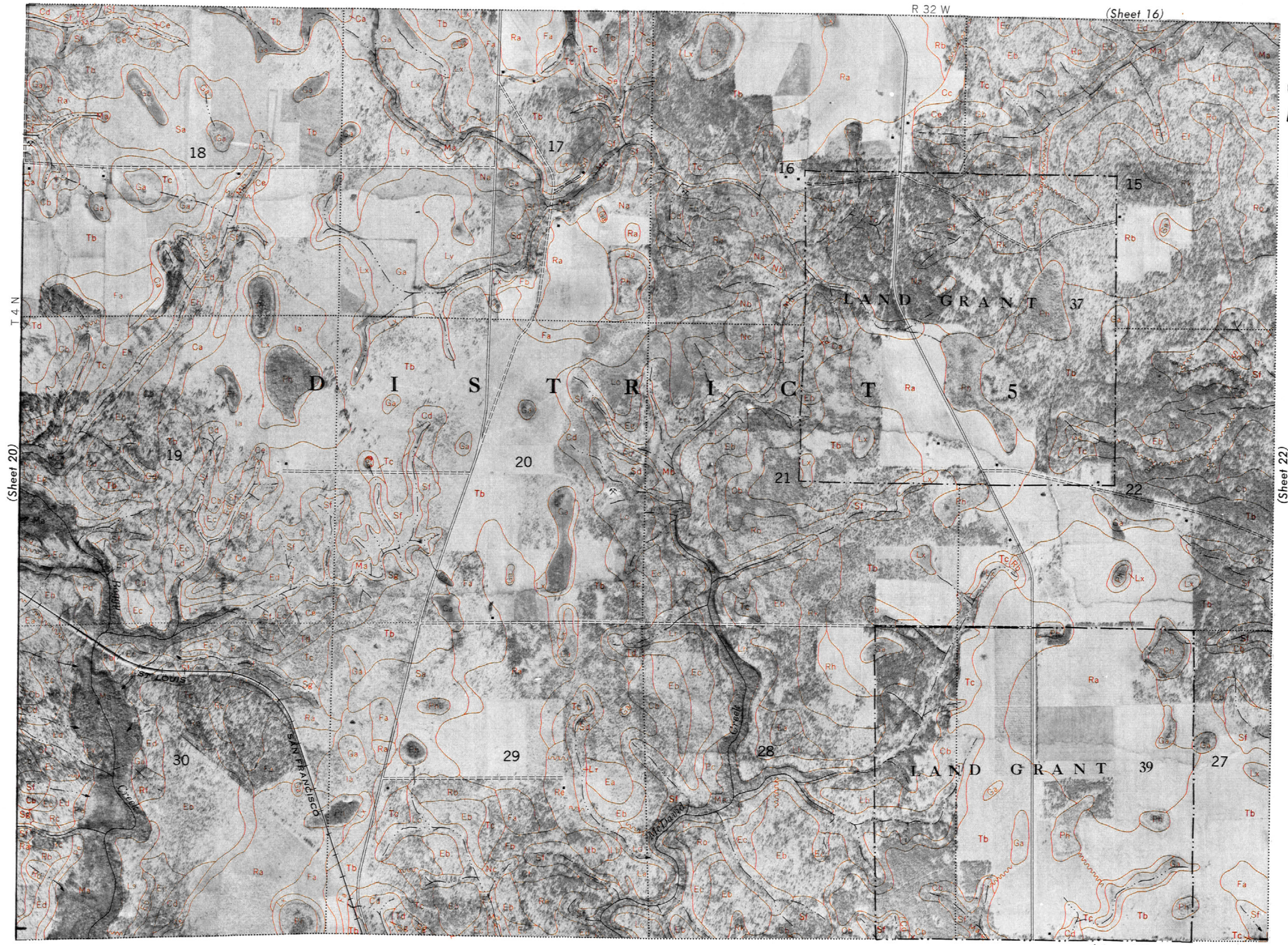
(Sheet 25)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA



0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

22

R 32 W | R 31 W

(Sheet 17)

N

T 4 N

(Sheet 21)

(Sheet 23)

(Sheet 27)

DISTRICT 5

Little Pine

Pine Barren Creek

Blue Water Creek

Pine Barren Creek

Pine Barren Creek

14 13 18 17 23 24 19 20 26 25 30 29

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

(Sheet 18)

23

R 31 W

T 4 N

(Sheet 22)

McDavid

Bogia

LAND GRANT 40

LAND GRANT 42

LAND GRANT 39

LAND GRANT 38

LAND GRANT 37

DISTRICT 5

16

15

21

22

23

27

28

43

Cotton Creek

Cotton Creek

LOUISVILLE & NASHVILLE

ESCAMBIA RIVER

SANTA ROSA CO

ESCAMBIA CO

29

(Sheet 28)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

(24)

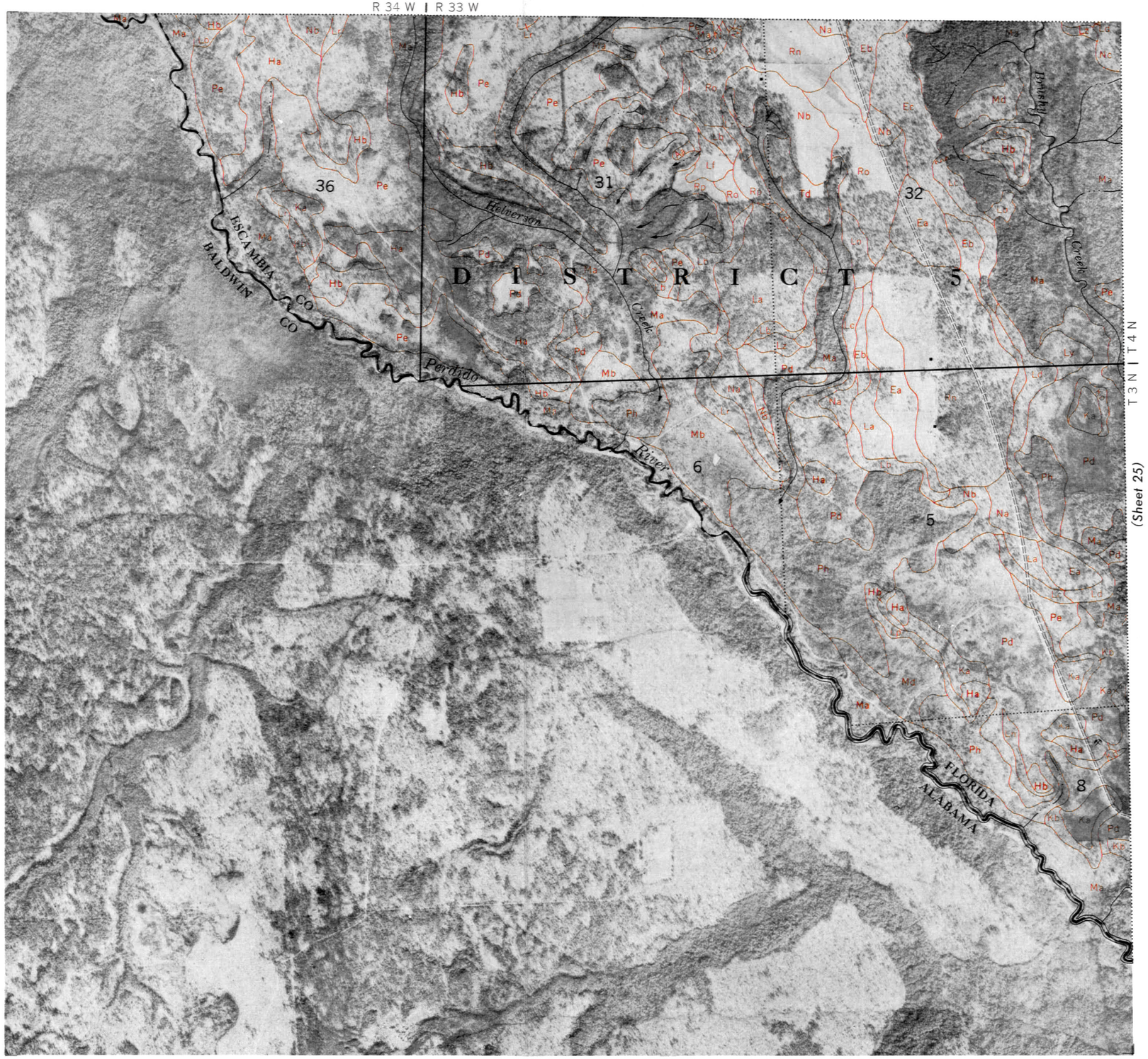
(Sheet 19)

N

R 34 W | R 33 W

T 3 N | T 4 N

(Sheet 25)



0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

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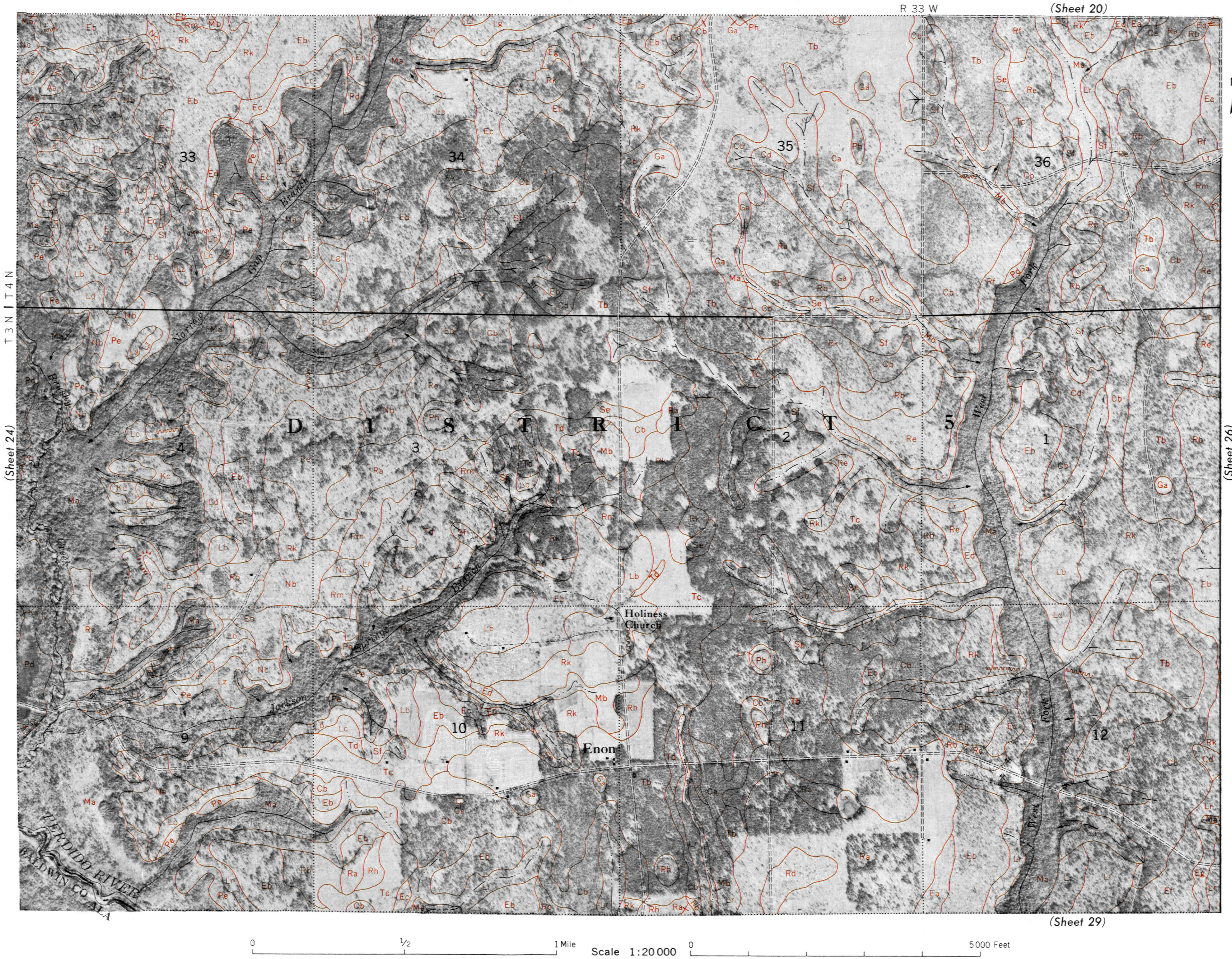


(Sheet 21)

R 32 W

N

T 3 N I T 4 N

(Sheet 25)

(Sheet 27)

(Sheet 30)

D I S T R I C T 5

31 32 33 34

6 5 4 3

7 8 9 10

Boggy Creek

SAN FRANCISCO

ST LOUIS

McDaniel Creek

McDaniel

Spring Hill Church

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

ESCAMBIA COUNTY, FLORIDA

R 32 W | R 31 W

(Sheet 22)

27

N

T 3 N | T 4 N

DISTRICT 5

(Sheet 26)

(Sheet 28)

(Sheet 31)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

28

(Sheet 23)

R 31 W

N

T 3 N | T 4 N

(Sheet 27)

(Sheet 32)

LAND GRANT 37

LAND GRANT 44

LAND GRANT 2

DISTRICT 5

33

34

4

9

Eh

Ef

Sd

Kb

Ha

Md

Ma

Ib

Nb

Rb

Pe

Lf

Lr

Ln

Lo

Ba

Hb

Ks

Ka

Ms

Ls

Lk

Sc

Se

Gb

Creek

Branch

Fletcher

Black

Gabbit

Pine Barren Creek

Brown Lake

Cotton Lake

ESCAMBIA RIVER

ESCAMBIA CO

SANTA ROSA CO

NASHVILLE AND LOUISVILLE

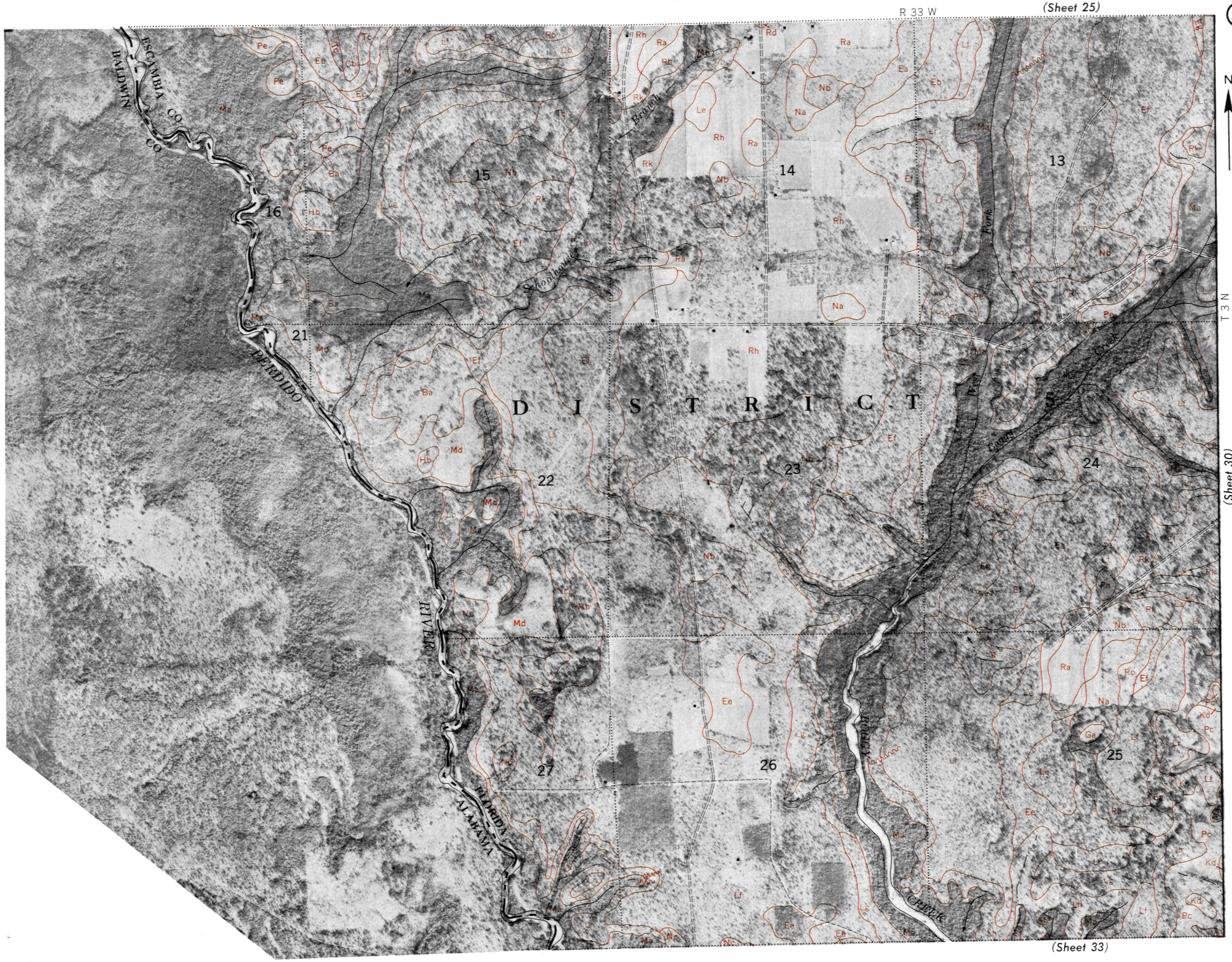
23

29

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet



0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

30

(Sheet 26)

R 32 W

N

T 3 N

(Sheet 29)

(Sheet 31)

McKinnon

Bay Springs

Bayou Creek

McDaniel Creek

McDaniel Creek

Bronch

Pond Creek

ST LOUIS

SAN FRANCISCO

18 17 16 15

19 20 21 22

30 29 28 27

D I S T R I C T 5

(Sheet 33) | (Sheet 34)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

R 32 W | R 31 W

(Sheet 27)

31

N

T 3 N

(Sheet 30)

(Sheet 32)

DISTRICT 5

Alligator Branch

Morgan Branch

Alligator Creek

Sections: 14, 13, 18, 17, 23, 24, 19, 20, 26, 25, 30, 29

(Sheet 34) | (Sheet 35)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

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32

(Sheet 28)

R 31 W

N

T 3 N

(Sheet 31)

Pine Barren

L A N D G R A N T 2

D I S T R I C T 5

Barren Creek

Pine Branch

Morgan Branch

Louisville & Nashville R.R.

Santa Rosa - Escambia Co Line

Escambia River

Pine Barren Creek

Barth

29

16 15 14 21 22 23 24 28 27 26

(Sheet 35) | (Sheet 36)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

(Sheet 29) R 33 W | R 32 W (Sheet 30)

33

N

T 2 N

T 3 N

(Sheet 34)

D I S T R I C T 5

34 35 36 1 31 32 6 5 7 8

ESCAMBIA CO.

BALDWIN CO.

PERDIDO RIVER

LOCKEY CREEK

ST. LOUIS & COAST RR.

SAN FRANCISCO Creek

FLORIDA

ALABAMA

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

(Sheet 30) | (Sheet 31)

34

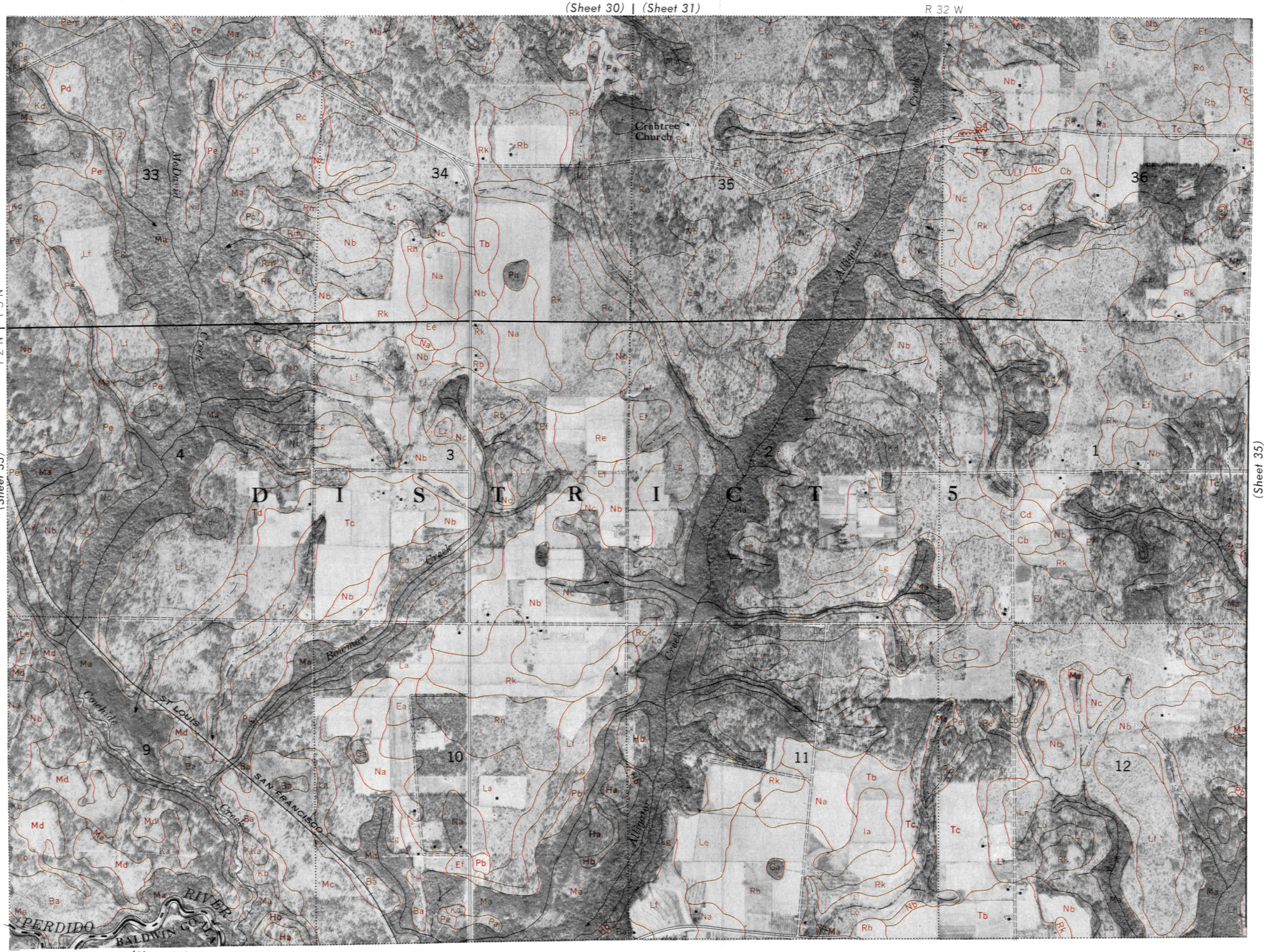
R 32 W

N

T 2 N | T 3 N

(Sheet 33)

(Sheet 35)



(Sheet 37)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

(Sheet 31) | (Sheet 32)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

(Sheet 32) R 31 W

N

T 3 N

(Sheet 35)

T 2 N

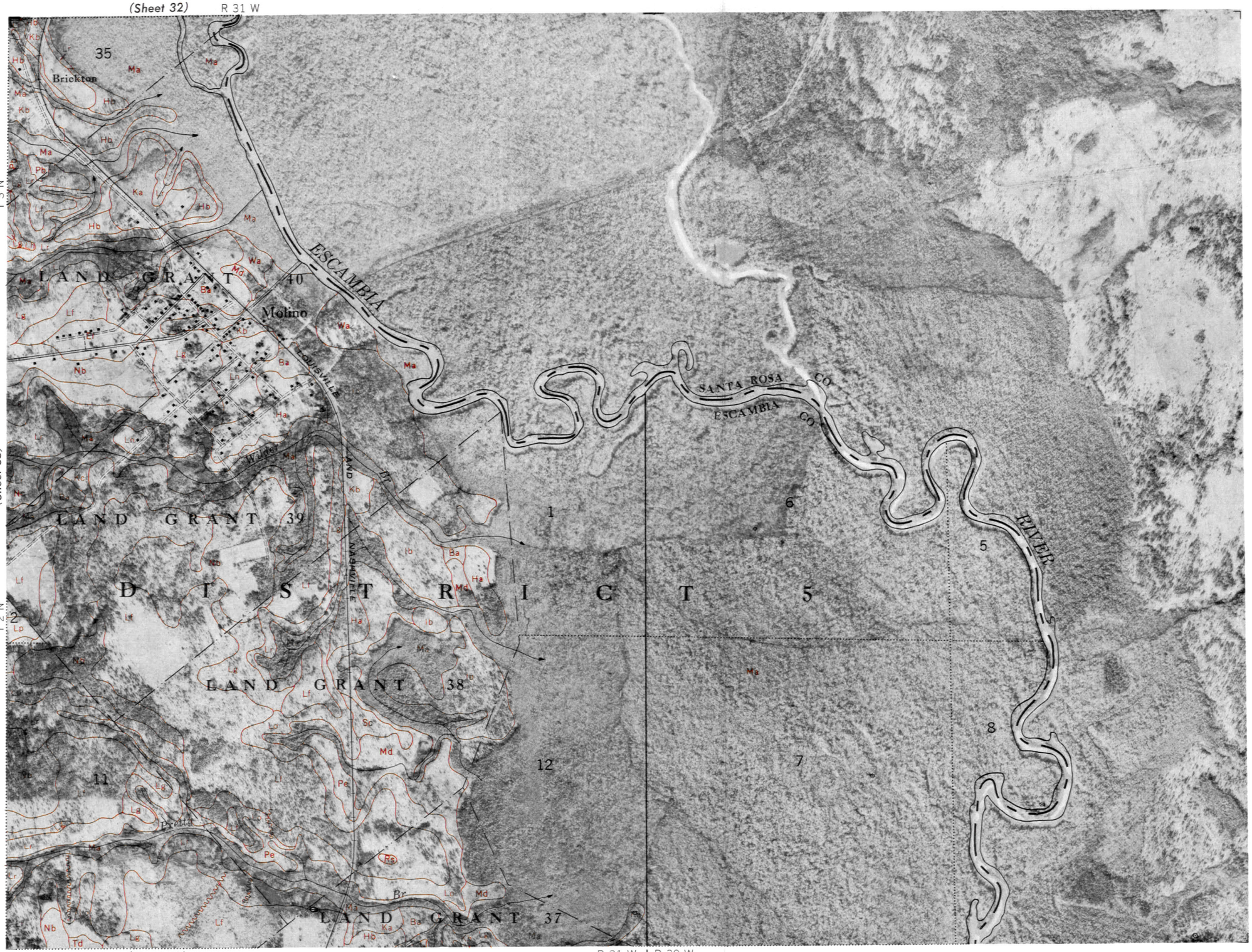
(Sheet 39)

R 31 W | R 30 W

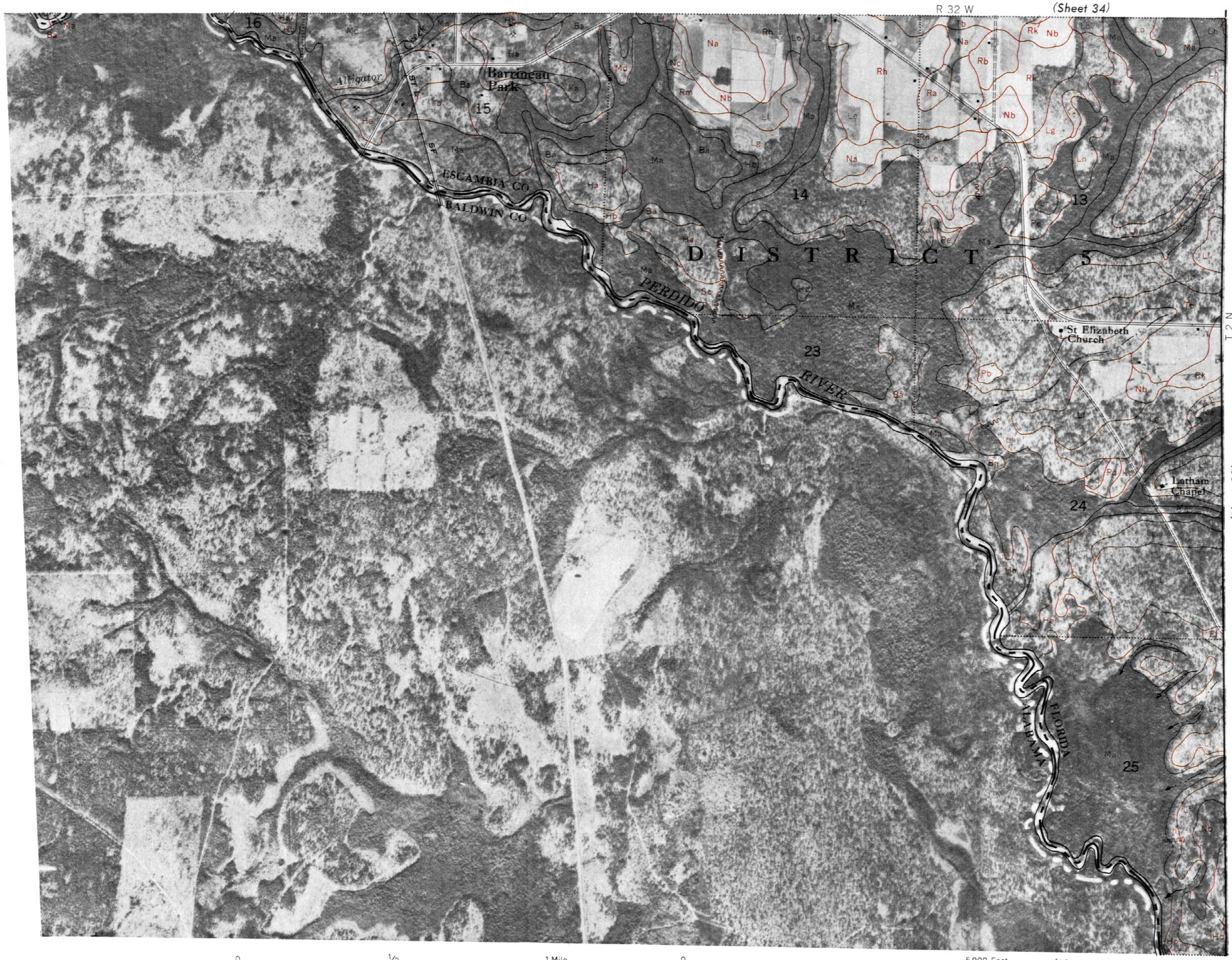
0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet



ESCAMBIA COUNTY, FLORIDA



0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Sheet 40)

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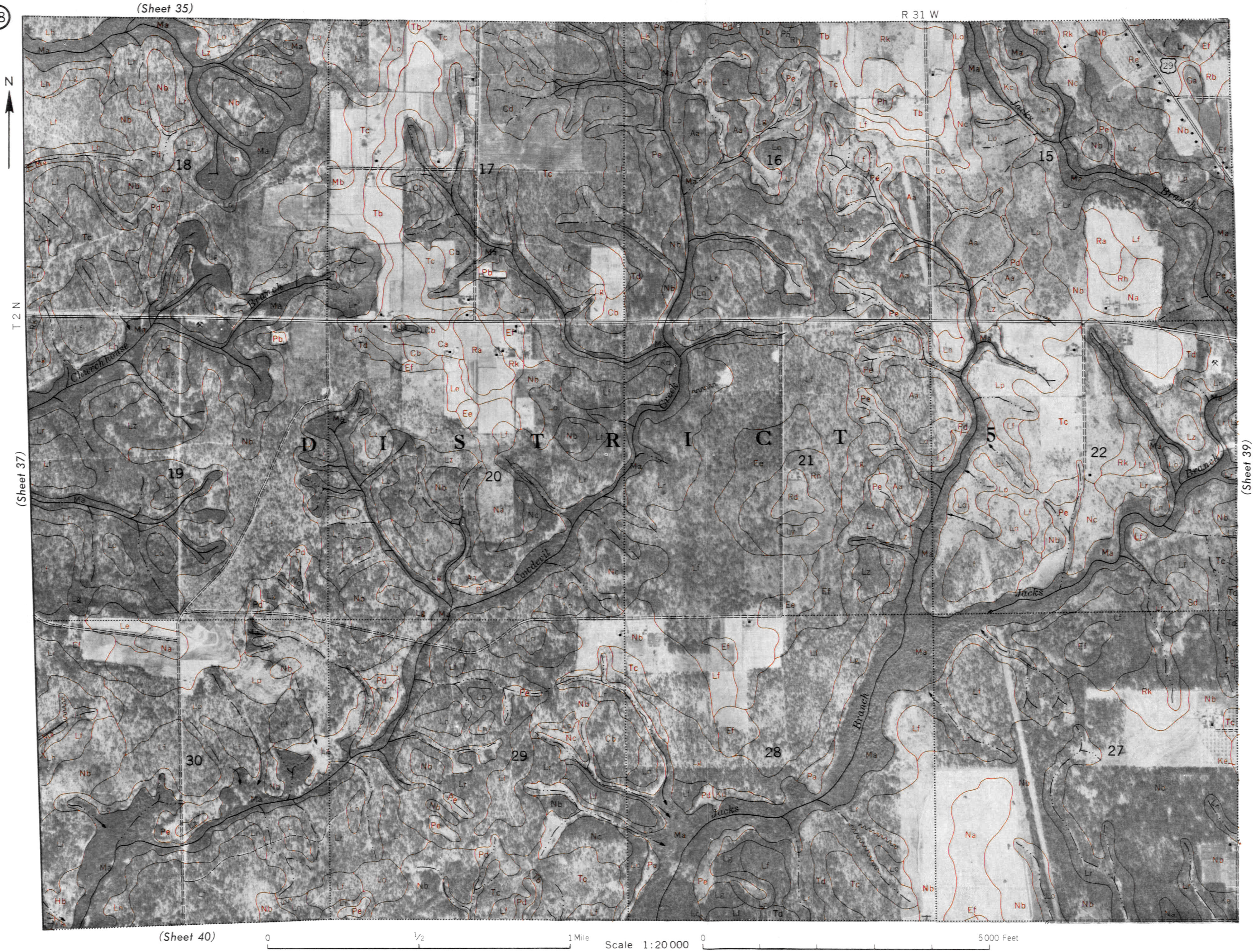

(Sheet 35)
R 31 W
N
T 2 N
(Sheet 37)
(Sheet 39)
(Sheet 40)
D I S T R I C T 5
Church house Branch
Jacks Branch
Cowdevil Creek
Jacks
Branch
29
15
16
17
18
19
20
21
22
27
28
29
30
0 1/2 1 Mile
Scale 1:20 000
0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

R 31 W | R 30 W

(Sheet 36)

N

T 2 N

(Sheet 38)

LAND GRANT

DISTRICT 5

14 13 18 17

23 24 19 20

26 25 30 29

Quintette

Quintette Lake

THE CANAL

ESCAMBIA CO
SANTA ROSA CO

ESCAMBIA RIVER

NASHVILLE AND

Rocky Branch

(Sheet 41)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

(Sheet 37) R 32 W | R 31 W (Sheet 38)

N

T 1 N | T 2 N

(Sheet 41)

(Sheet 42) | (Sheet 43)

DISTRICT 5

Cantonment

ABA FLA

RIVER

PERDIDO

BALDWIN CO

ESCAMBIA CO

Jacks Branch

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

(Sheet 39)

41

R 31 W | R 30 W

T 1 N | T 2 N

(Sheet 40)

N

Cottage Hill

Cantonment

DISTRICT 5

LAND GRANT 39

LAND GRANT 38

LAND GRANT 30

LAND GRANT 14

NASHVILLE AND LOUISVILLE

ESCAMBIA RIVER

SANTA ROSA CO

ESCAMBIA CO

Becks Lake

Walnut Creek

Beck Creek

Mill Creek

BECKS CAMP

35 36 31 32 6 5 1 2 11 12 4 3

(Sheet 43) | (Sheet 44)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

42

(Sheet 40)

R 32 W | R 31 W

N

ALABAMA
FLORIDA

PERDIDO RIVER

BALDWIN CO
ESCAMBIA CO

Muscogee

ST LOUIS SAN FRANCISCO

Farm Hill Church

Mission Cemetery

D I S T R I C T

13 19 18 17
24 20 21 22
25 32 31 30
26 5

(Sheet 43)

(Sheet 45) | (Sheet 46)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

(Sheet 40) | (Sheet 41)

R 31 W | R 30 W

T 1 N

(Sheet 42)

(Sheet 44)

(Sheet 47)

N

DISTRICT

LAND GRANT 30

LAND GRANT 14

LAND GRANT 12

LAND GRANT 13

ST LOUIS

SF

ST L

LOUISVILLE AND NASHVILLE

SAN FRANCISCO

Gonzalez

Tate School

Gonzalez Church

Mill Creek

Eleven Mile Creek

Mile Creek

Simmons

29

15

16

23

24

25

27

28

11

12

13

5

20

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

(Sheet 41)

R 30 W

N

T 1 N

(Sheet 43)

Spanish Creek

Mill Creek

ESCAMBIA

SANTA ROSA CO

ESCAMBIA CO

GOVERNORS

RIVER

BAYOU

Snake Creek

Clear

LAND GRANT 30

LAND GRANT 25

DISTRICT 5

NASHVILLE AND LOUISVILLE

Jordan Cemetery

10

14

15

19

18

17

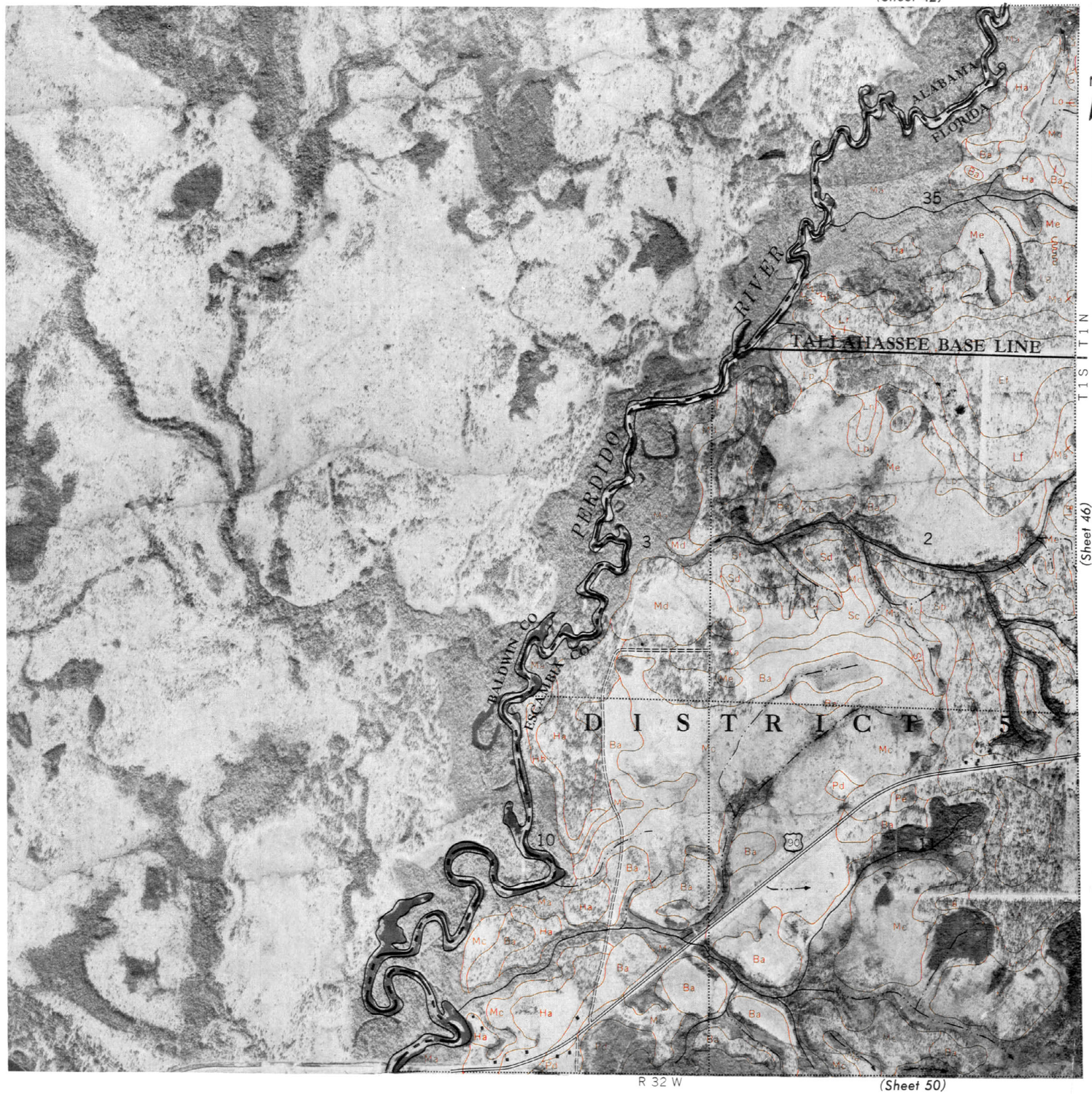
(Sheet 48)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

(Sheet 42)



(Sheet 46)

(Sheet 50)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

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46

(Sheet 42)

R 32 W | R 31 W

N

T 1 S | T 1 N

TALLAHASSEE BASE LINE

D I S T R I C T 5

36 33 34 35

1 6 5 4

12 7 8 9

Buelah Church

(Sheet 45)

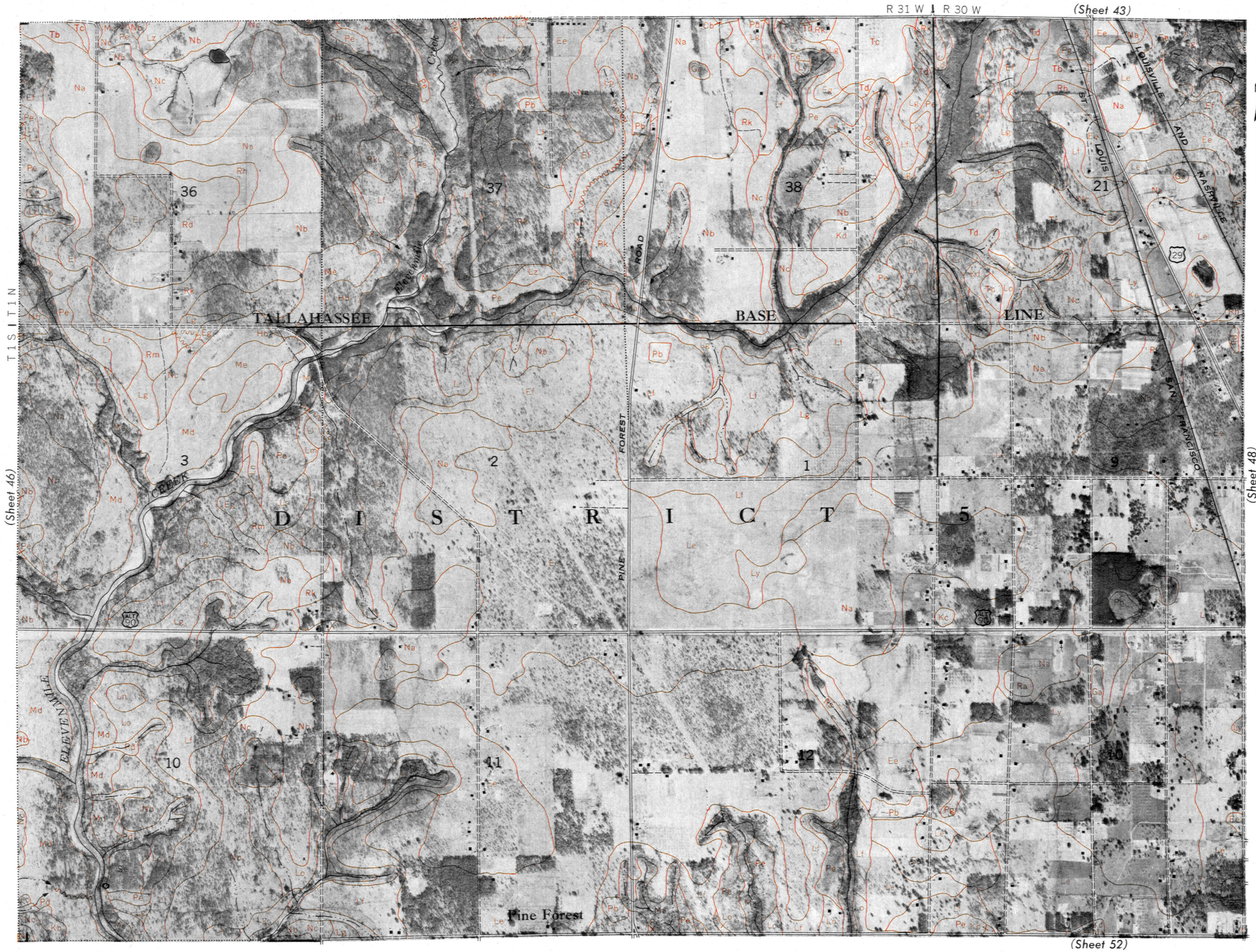
(Sheet 47)

(Sheet 51)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet



48

(Sheet 44)

R 30 W

N

T 1 S. T 1 N

Clear Creek

NASHVILLE AND LOUISVILLE RR

BAYOU THOMPSON

ESCAMBIA RIVER

ESCAMBIA CO

SANTA ROSA CO

22 23 24 25

LAND GRANT

LAND GRANT 27

TALLAHASSEE BASE LINE

Crossroads Church

LOUISVILLE AND NASHVILLE RR

LAND GRANT

8 7 6 5

D I S T R I C T 5

53

(Sheet 47)

(Sheet 49)

ST. LOUIS SAN FRANCISCO RR

AIRFIELD

11 12 13 14

Ensley

LAND GRANT 20

(Sheet 53)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

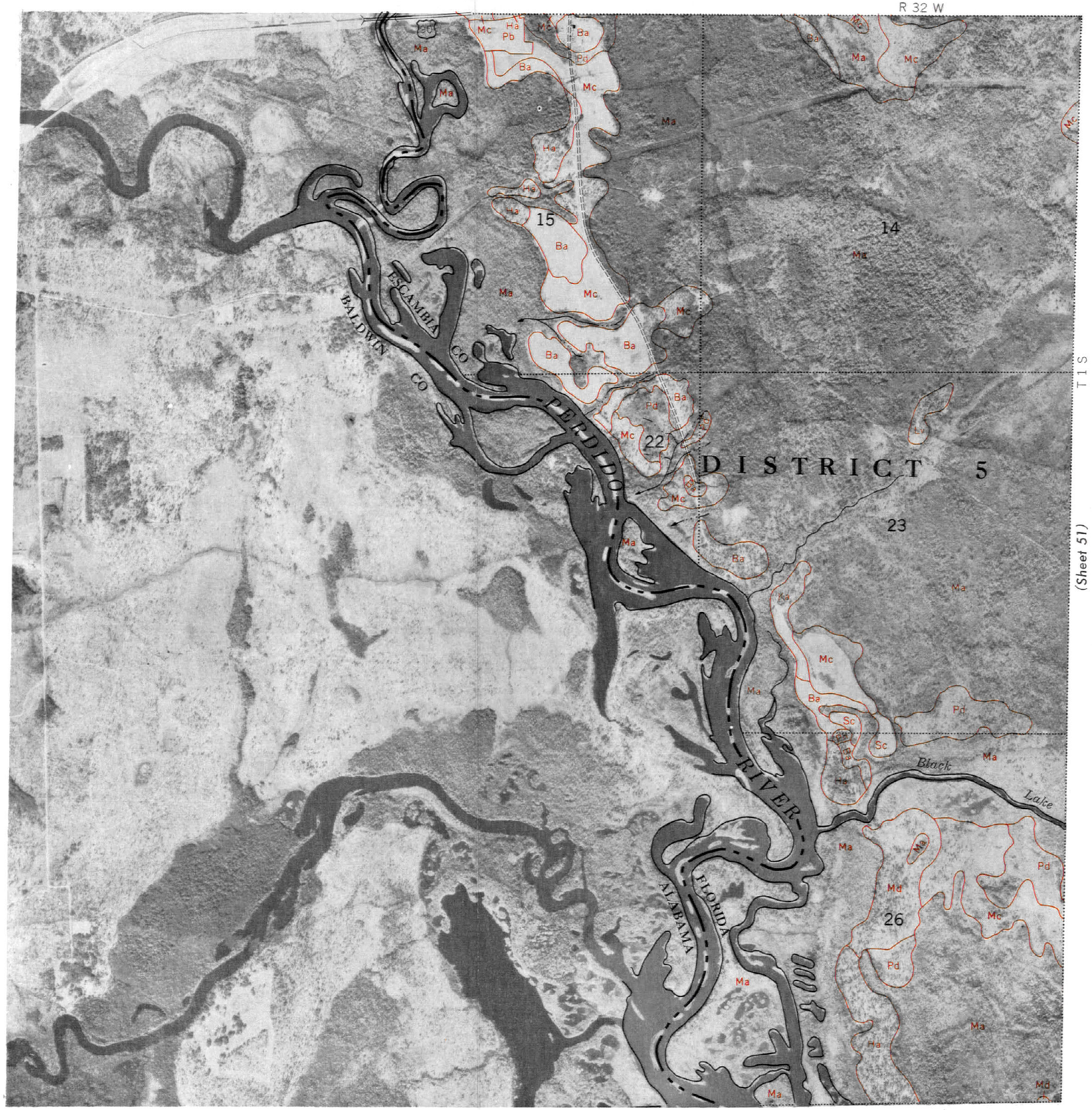
50

(Sheet 45)

N

R 32 W

T 1 S



(Sheet 51)

(Sheet 55)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

R 32 W | R 31 W

(Sheet 46)

T 1 S

(Sheet 50)

(Sheet 52)

(Sheet 55) | (Sheet 56)

N

13 18 17 16

24 19 20 21

25 32 31 30

5

D I S T R I C T

Buelah School

Buelah Church

Black Lake

Hurst

Branch

LAND GRANT 40

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

52

(Sheet 47)

R 31 W | R 30 W

N

T 1 S

Pine Forest Church

ELEVENMILE CREEK

Elevenmile Creek

Eightmile Creek

D I S T R I C T 5

ROAD

FOREST

PINE

15 14 13 23

22 23 24

29 26 25 41

LAND GRANT 26

LAND GRANT 28

LAND GRANT 36

LAND GRANT 39

Klondike Church

90

(Sheet 51)

(Sheet 53)

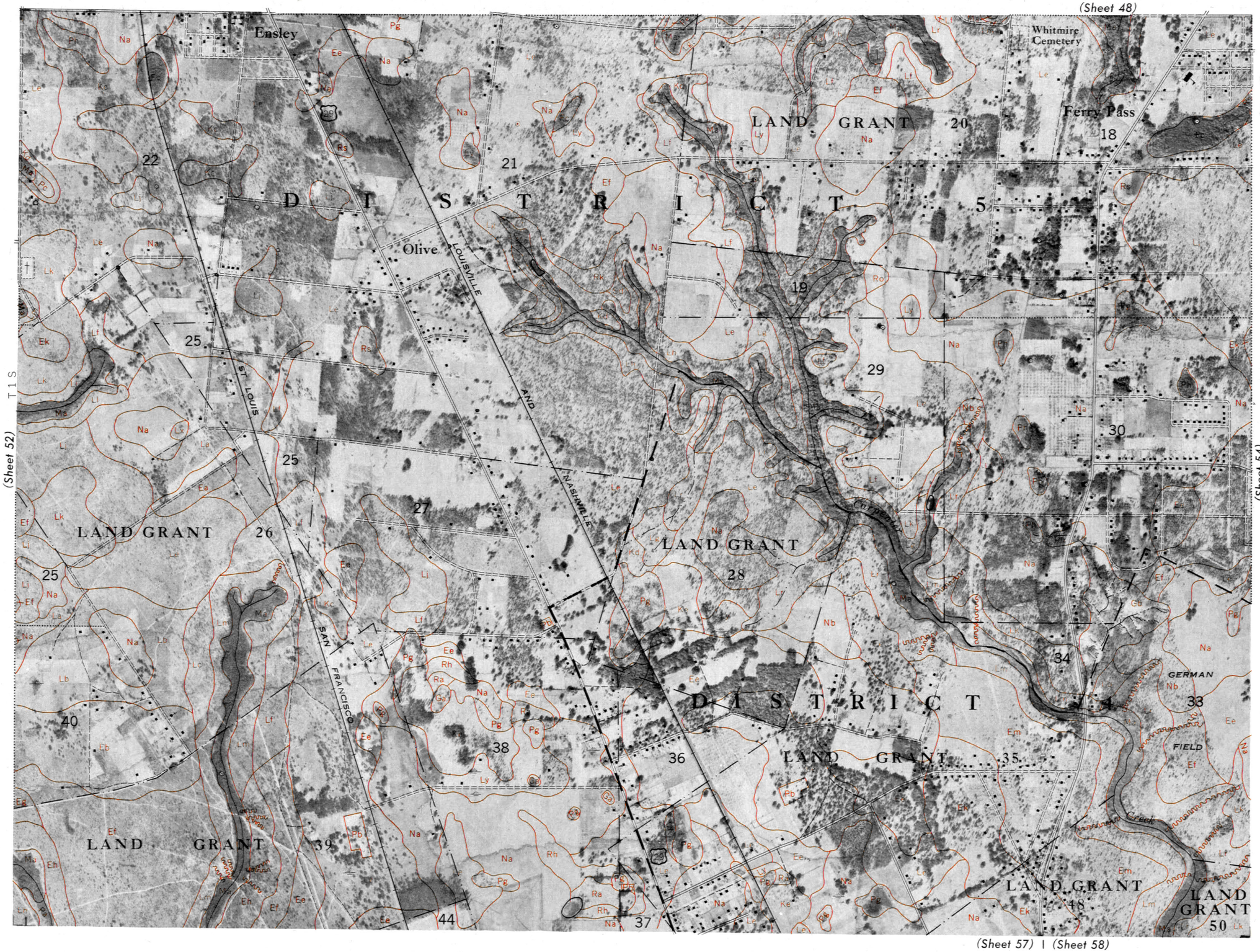
(Sheet 56) | (Sheet 57)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

(Sheet 48)



(Sheet 52)

(Sheet 54)

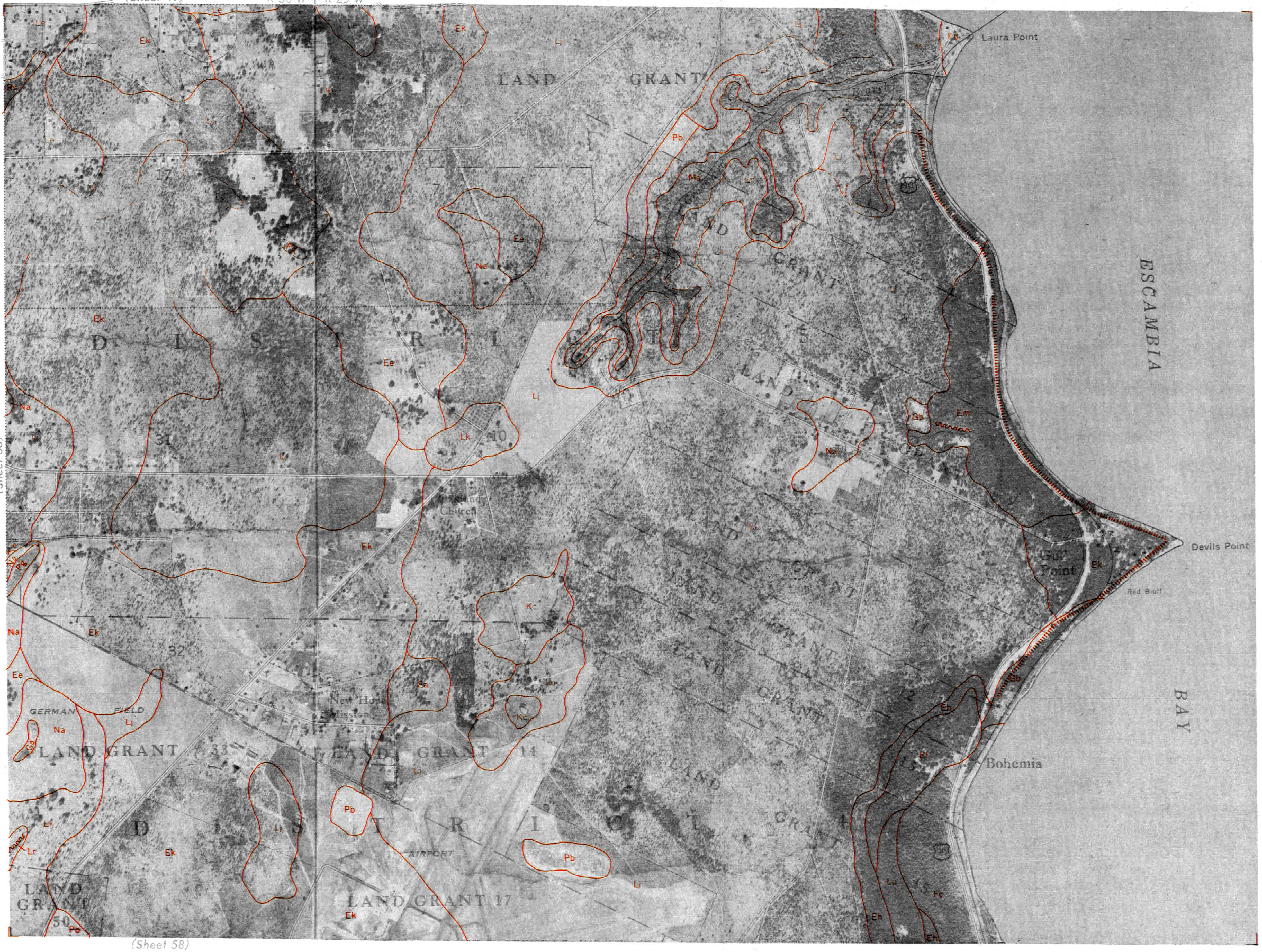
(Sheet 57) | (Sheet 58)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

54



Scale 1:20000
0 ½ 1 Mile
0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

(Sheet 50) | (Sheet 51)

R 32 W | R 31 W

N

T2S | T1S

(Sheet 56)

(Sheet 59)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1951.

(Sheet 51) | (Sheet 52)

R 31 W | R 30 W

N

T 2 S | T 1 S

(Sheet 55)

(Sheet 57)

(Sheet 60)

MILE CREEK

ELEVEN

SAUFLEY FIELD

LAND GRANT 40

LAND GRANT 36

LAND GRANT 41

LAND GRANT 39

LAND GRANT 42

LAND GRANT 38

LAND GRANT 37

LAND GRANT 8

D I S T R I C T 5

D I S T R I C T 4

Belleview

Holiness Church

Saints Church

Ramsey Beach

PERDIDO BAY

Young's Hammock

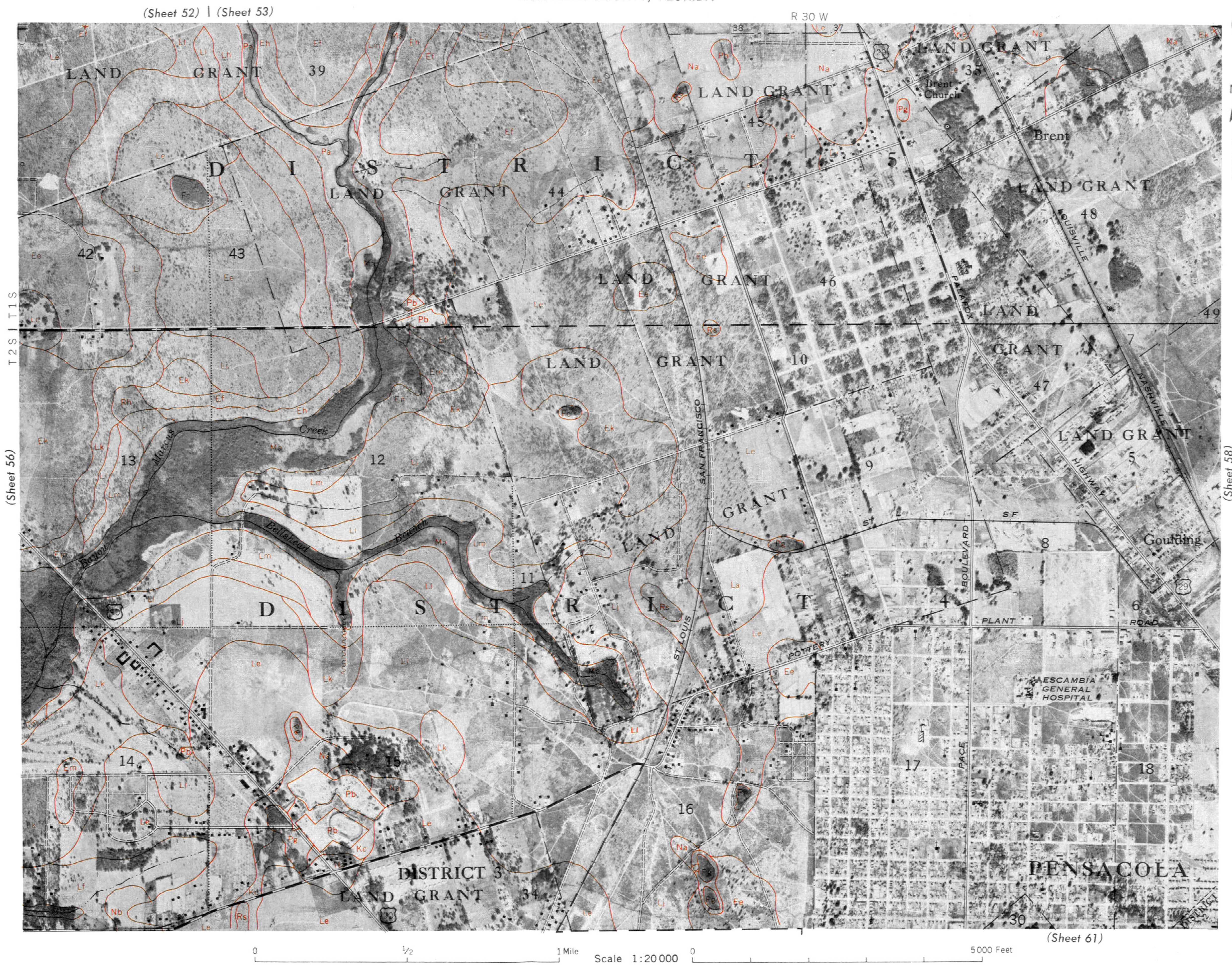
Bayou Marcus Creek

Creek

Scale 1:20000

0 1/2 1 Mile

0 5000 Feet



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58

(Sheet 53) | (Sheet 54)

R 30 W | R 29 W

N

T2S | T1S

(Sheet 57)

LAND GRANT 50

LAND GRANT 48

LAND GRANT 49

LAND GRANT 33

LAND GRANT 17

LAND GRANT 15

LAND GRANT 16

LAND GRANT 18

LAND GRANT 5

LAND GRANT 3

LAND GRANT 1

LAND GRANT 2

LAND GRANT 4

LAND GRANT 58

LAND GRANT 5 East Pensacola Heights

DISTRICT 1

DISTRICT 2

DISTRICT 3

DISTRICT 4

PENSACOLA

Carpenter Creek

AIRPORT

Gaberonne

Newhope Church

HOLY CROSS CEMETERY

BAYOU TEXAR

ESCAMBIA BAY

Magnolia Bluff

LOUISVILLE & NASHVILLE

TWELFTH AVENUE

NINTH AVENUE

DAVIS STREET

PALAFOX STREET

NASHVILLE STREET

(Sheet 62)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

N

ALABAMA
FLORIDA

BAY

PERDIDO

BALDWIN CO
ESCAMBIA CO

LILLIAN BRIDGE

Paradise Beach

Cummings Point

Nix Point

Double Point

BRIDGE CREEK

LILLIAN HIGHWAY

Millview Church

PENSACOLA KENNEL CLUB

DISTRICT

T 2 S (Sheet 60)

(Sheet 63) | (Sheet 64)

R 32 W | R 31 W

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

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60

(Sheet 56)

R 31 W | R 30 W

N

BAYOU MARCUS CR.

BAY

PERDIDO

LAND GRANT

LILLIAN HIGHWAY

98

Sand Cut

Millview

Myrtle Grove

LAND GRANT 37

LAND GRANT 53

LAND GRANT 54

LAND GRANT 56

CORRY FIELD

Swamp

Swamp

8 11 12 13 14 17 18 19 20 21 22 23 24 35 36 4

D I S T R I C T

T 2 S

(Sheet 59)

(Sheet 61)

(Sheet 64)

(Sheet 65)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

(Sheet 58)

R 30 W | R 29 W

N

T 2 S

(Sheet 61)

LAND GRANT 27

DISTRICT 2

DISTRICT 3

DISTRICT 4

DISTRICT 1

LAND GRANT 5

BAYOU TEXAR

East Pensacola Heights

Emanuel Point

HOSPITAL

CERVANTES STREET

LOUISVILLE & NASHVILLE STATION

POST OFFICE STREET

SAINT MICHAELS CEMETERY

GARDEN STREET STATION

COUNTY COURT HOUSE

LIBRARY

SAN FRANCISCO

ST LOUIS

PENSACOLA BAY

PENSACOLA

ESCAMBIA CO

SANTA ROSA CO

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

ESCAMBIA COUNTY, FLORIDA

R 32 W | R 31 W

T 3 S | T 2 S

N

BALDWIN CO
ESCAMBIA CO

ALA
FLA

B A Y

P E R D I D O

D I S T R I C T

TARKILN FIELD

BAYOU TARKILN

TARKILN BAY

(Sheet 64)

(Sheet 66) | (Sheet 67)

Scale 1:20 000

0 ½ 1 Mile

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

64

(Sheet 59) | (Sheet 60)

R 31 W

N

T3S | T2S

(Sheet 63)

(Sheet 65)

(Sheet 67) | (Sheet 68)

Bridge Creek

Jones Swamp

LAND GRANT 4

LAND GRANT 5

DISTRICT 3

LAND GRANT

BAYOU GRANDE

GULF BEACH HIGHWAY

Pleasant Grove

Garcon Swamp

28 29 31 32 35

9 8 6 12 13 14 15

SURVEY NOT AVAILABLE FOR PUBLICATION

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA

R 32 W

(Sheet 63)

N

ALABAMA
FLORIDA

BALDWIN CO
ESCAMBIA CO

P E R D I D O B A Y

BAYOU GARCON

(Sheet 67)

T 3 S

Inerarity Point

D I S T R I C T 3

Bayou Kees

Inerarity Church

WATERWAY

INTRACOASTAL

10 14 15 27

Cf Ta Lv Pc Lu Lt Rs

FLORIDA
ALABAMA

ESCAMBIA CO
BALDWIN CO

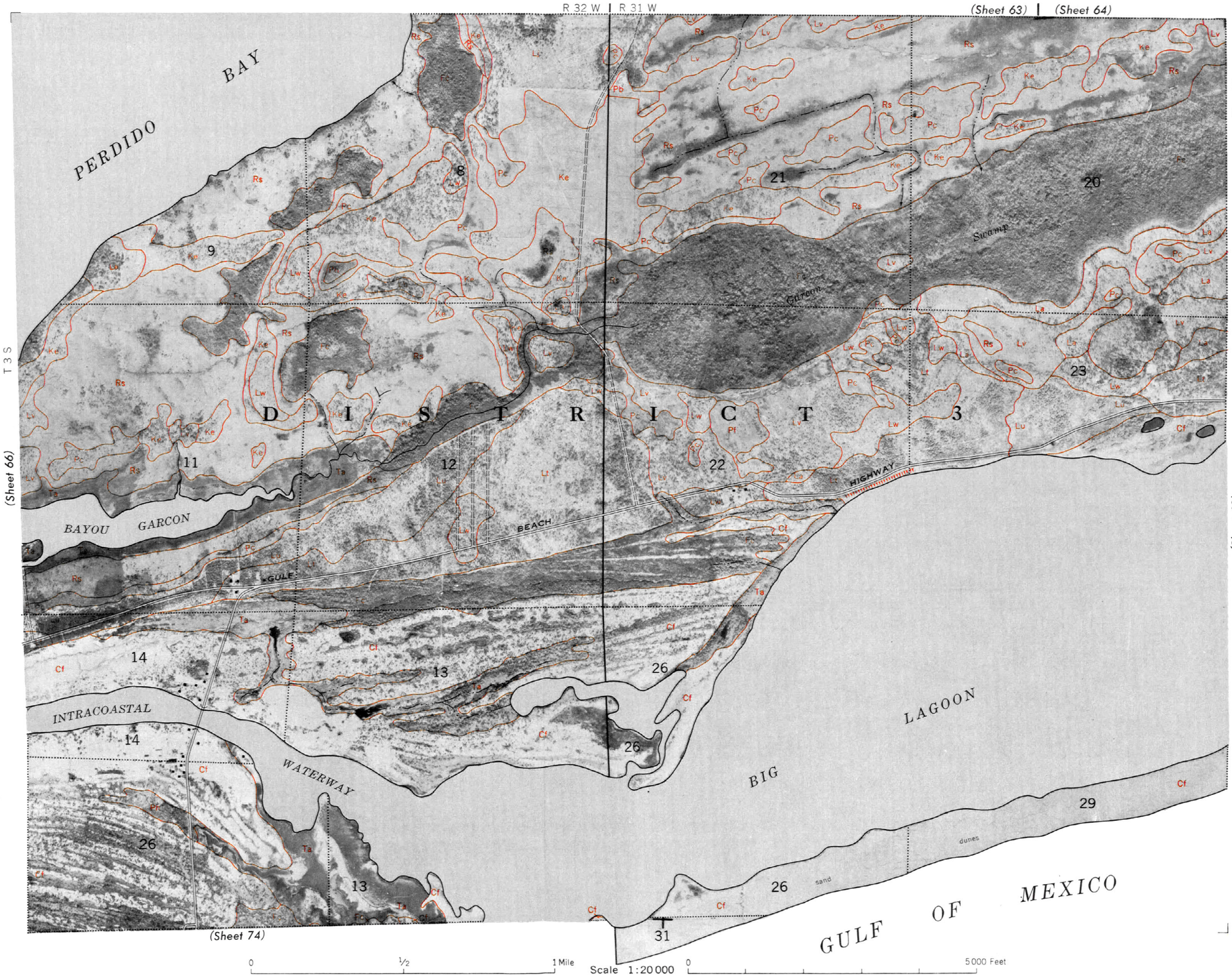
(Sheet 73) | (Sheet 74)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

ESCAMBIA COUNTY, FLORIDA



R 31 W

(Sheet 64) | (Sheet 65)

N

T 3 S

(Sheet 67)

(Sheet 69)

LAND GRANT

DISTRICT 3

LAND GRANT 17

Swamp

Garcon

HIGHWAY

BEACH

GULF

INTRACOASTAL WATERWAY

PENSACOLA BAY

Davenport Bend

Trout Point

LAGOON

BIG

Redfish Point

Spanish Point

Langley Point

sand dunes

GULF OF MEXICO

15

17

18

19

24

25

30

33

34

Lv Ke Rs Fc Lw Pc La Lf Ta Cf Li Lk

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

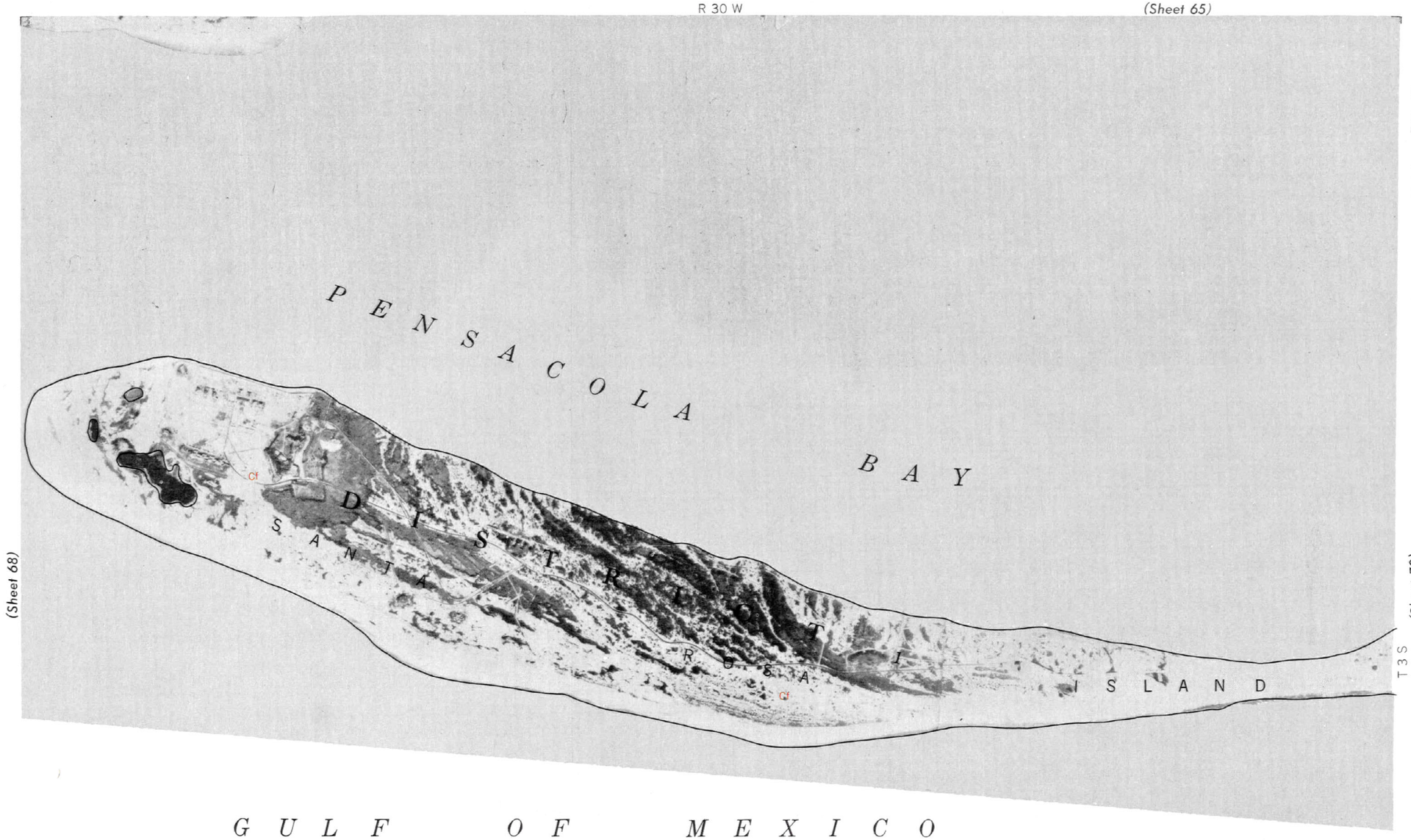
ESCAMBIA COUNTY, FLORIDA

R 30 W

(Sheet 65)

69

N



GULF OF MEXICO

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

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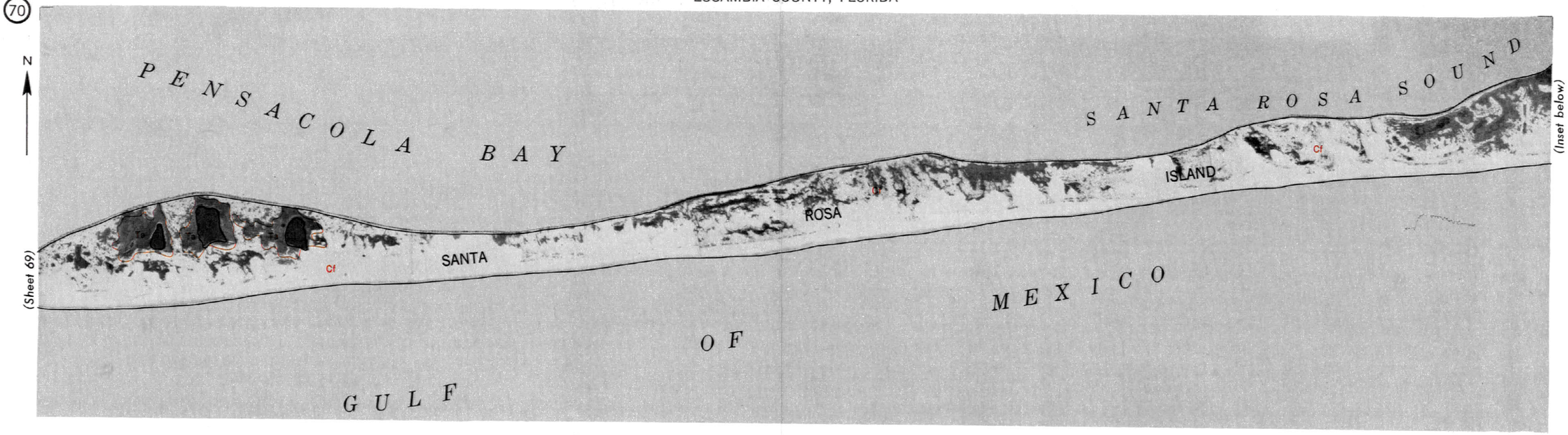
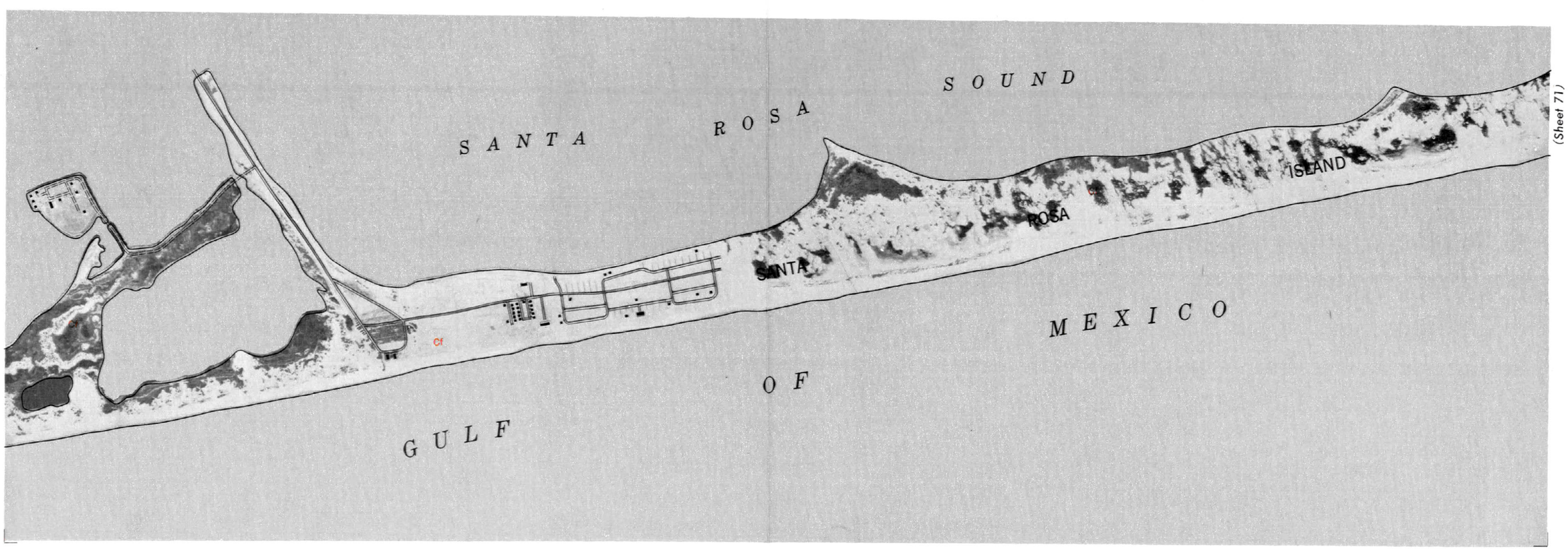
N



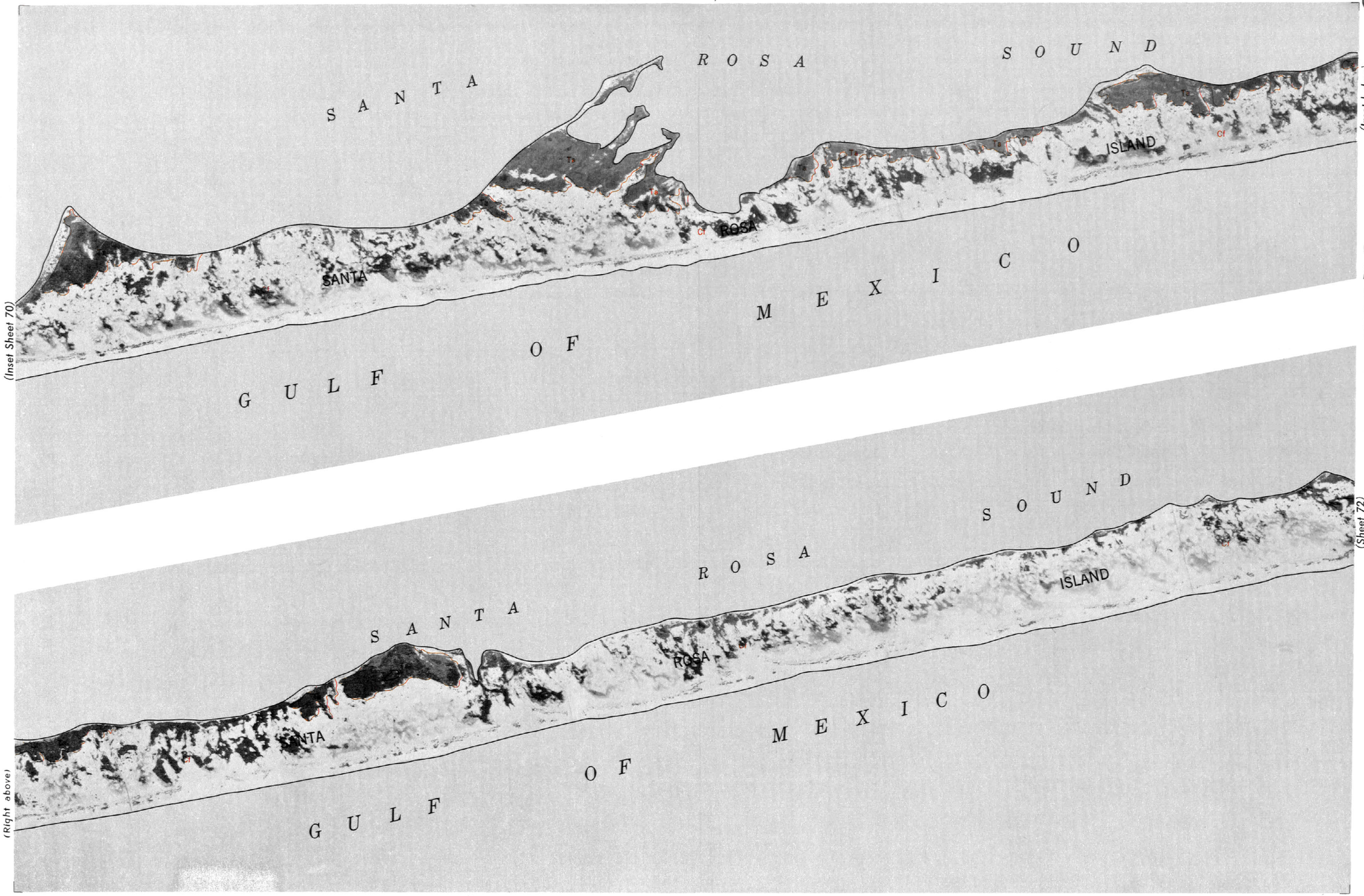
(Sheet 69)

(Inset below)



(Sheet 71)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet



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ESCAMBIA COUNTY, FLORIDA

N

SANTA ROSA SOUND

SANTA ROSA ISLAND

Cf

Cf

Cf

(Inset Sheet 71)

(Inset below)

GULF OF MEXICO

SOUND

SANTA ROSA ISLAND

SANTA ROSA

Cf

Cf

COUNTY

OKALOOSA

(Right above)

GULF OF MEXICO

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

N

ALABAMA
FLORIDA

RIVER

OLD

BALDWIN CO
ESCAMBIA CO

DISTRICT 1

T 4 S | T 3 S

R 33 W | R 32 W

32

31

5

6

3

2

1

Cf

Ta

GULF OF MEXICO

(Sheet 74)

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet

(Sheet 66) | (Sheet 67)

R 32 W

N

T 4 S | T 3 S

(Sheet 73)

BALDWIN CO ALA
ESCAMBIA CO FLA

OLD RIVER

DISTRICT

dunes

sand

Cf

Fs

Ta

EIG LAGOON

Golf Beach

32 33 34 35 36 3

GULF OF MEXICO

0 ½ 1 Mile

Scale 1:20000

0 5000 Feet